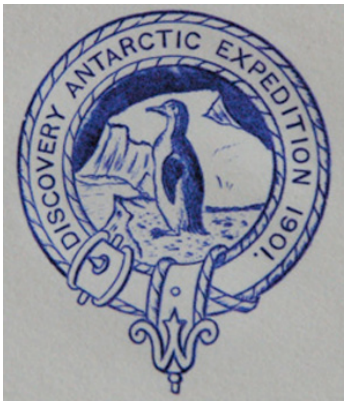

New Light on the British National Antarctic Expedition (Scott's *Discovery* Expedition) 1901-1904.

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Graduate Certificate in Antarctic Studies (GCAS X), 2007/2008

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1 : PREAMBLE

1.1 The Canterbury Connection

This work analyses some elements of Scott's *Discovery* expedition and is specifically informed by materials available in the Canterbury district of New Zealand. It draws on fresh resources now accessible in the public domain in the antipodes, and from a private collection held by the family of physicist, Louis Bernacchi.

A central source for this work is the original journal of Louis Bernacchi, (for most of 1902) that resides in the manuscripts collection of the Canterbury Museum, Christchurch. (Bernacchi 1902)

Letters and documents in the possession of Bernacchi's granddaughter, a resident of Lincoln, also in the Canterbury district, further inform this research. This collection has only recently been acquired and my preliminary analysis (over two days in early 2008) is the first made by a polar historian. The collection may have gone unread for almost a century. It is extensive and has yet to be fully catalogued and annotated. Section 1 of this paper provides a brief history of Bernacchi in order to set the context and to rectify some often-repeated biographical errors.

There are some letters written from the ice by Louis to his close brother Roderick that support my reasoning. Bernacchi's correspondence with messmates upon the return of the *Discovery* inform my opinions about the measure of success of the expedition and provide clues regarding expedition management. There is also a significant body of (mostly brief) correspondence with central figures in British polar circles of the early twentieth century. These sources expand our knowledge of character and personality of expedition members of the *Discovery*.

Baden Norris (Emeritus Curator of Antarctic History at the Canterbury Museum) has made the diary of Petty Officer James Duncan, shipwright and Carpenter's Mate available to me. It contains some personal comments and provides a different (lower deck) view of routine life on the ship, especially during the winter months. This is only otherwise available in Dundee Museum (to the best of my knowledge) so I have mined this source of commentary from the mess deck of the *Discovery*.

1.2 Primary sources of note

Other sources that will provide alternate perspectives on events of the first year (1902) of the expedition are those of (Chief Engineer) Reginald Skelton (published 2004) and (1st Executive Officer) Lieutenant Charles Royds (published 2001, only 150 copies printed). Neither of these were ever intended for publication. They provide some candid comment that is otherwise unavailable. Both are also obscure in the public domain.

Thomas Vere Hodgson (Biologist), William Heald (Able seaman) and William Lashly (Leading Stoker) also provide some personal diary descriptions of events, although mostly descriptive and scanty in personal observations or detail. Scott's *Voyage of Discovery*, the official version of the expedition's events, and Albert Armitage's narrative, *Two years in the Antarctic*, provide somewhat sanitised versions, as does Bernacchi's *Saga of the Discovery* published in 1938.

1.3 Intent of this paper

Most literature about Captain Scott relates to his final tragic *Terra Nova* expedition, and narrative of the *Discovery* expedition is eclipsed. The value of the *Discovery* expedition turned out ultimately to be a training exercise for Scott's later enterprise. It had considerable geographic and scientific successes that are not adequately recognised.

This analysis is extended to determine whether the *Discovery* expedition achieved Sir Clements Markham's prime objective. He imagined a polar expedition that would be a springboard to promotion and advancement for ambitious young officers and men.

This paper enhances the body of literature on polar history through deeper analysis of some of the key events, the presentation of new theses regarding outcomes of the *Discovery* expedition and by making first comparisons of personal accounts of certain events. These are used to elaborate three key questions:

- Did the expedition achieve its stated objectives?
- How did technique and technology for polar expedition work evolve on this enterprise?
- Were the crew well served by the diversions instituted to maintain emotional, mental and physical wellbeing over the polar winter?

I have honed the focus by selection of themes, and highlight events from the first year of the expedition that are especially telling, and that have been reported variously in the diaries and journals mentioned. I focus on interpersonal relations and represent insights into character wherever possible. This is intended to address the shortfall of commentary on crewmember's personality and character represented in available literature. A brief, preliminary life history of the central character, Louis Bernacchi, is required to provide context to the reader.

I use quotes from letters and diaries that support my points, and which describe and elucidate the social climate and activities of the expedition. I also draw on secondary sources in support of my statements. Throughout this study dates refer to 1902 unless otherwise specified. Quotes from diaries, journals and correspondence are faithful to the original with respect to spelling, punctuation and grammar except where they are unintelligible.

2 : Bernacchi's road to *Discovery*

2.1 Maria Island to Melbourne

Louis Charles Diego Bernacchi was not born in Tasmania as most biographical sources suggest. He was born in one of the communes of Brussels known as Schaerbeek on November 8th, 1876. [Appendix I]. His father (Diego) had a family background in textiles. The family moved from Britain to Australia in 1884 ostensibly for health reasons, but most likely due to a falling-out between Diego and his father, over his choice of Barbe Straetmans (of Flemish descent) for his wife. Diego took up land on Maria Island on the east coast of Tasmania and the family settled there. He attempted to establish sericuture (growing mulberry trees for silk production) as the prime income producer, supplemented by vineyards. Ultimately a cement works (using local raw materials) and a coffee palace were established in an effort to diversify and expand income streams. Wine production was the most successful of these enterprises. The family were well educated and intellectual. Diego spoke five languages. Present day descendants are also scholars and linguists. (Palmer, pers. comm.)

Louis had a rural and maritime childhood on the island. He lived:

> *..amidst those wild but enchanted surroundings, I learnt to ride, to shoot, to manage single handed a 22-ft. whale-boat, and to "rough it" in many outdoor ways*. (Bernacchi 1938)

At age twelve Louis was admitted to the Hutchins School in Hobart to commence his scholarship, being admitted on May 6th, 1889 and finishing at the school around Easter 1891. (Archives Office of Tasmania, NB36/ Page:130). He transferred to Melbourne to study physical sciences and was visiting Melbourne Observatory during 1895. He later studied terrestrial magnetism and related navigation and astronomical instrument skills full time.

One account (Swan 1963) claims the family was naturalised in 1886, but this is contrary to other evidence that Louis applied for himself and his close brother Roderick seeking naturalisation in 1900. The request was denied at that time as "

> *…. letters of naturalisation are only granted….to aliens now residing in Tasmania.* (Archives of Tasmania 26/12/1900, CSD/22/38)

Louis and Roderick were both living in England at that time thus the request was rejected. In any event, Louis must have gained standing as an Englishman as he was able to contest parliamentary seats in England after his return from Antarctica. He perceived himself as an Englishman. In a letter to his brother Roderick (Dick) from the Falklands on his return from the ice Louis laments that he and Dick have crossed paths and:

> *…as you say it might be years before we meet however it is inevitable & there is some consolation in the fact that the sons of nearly all English families are placed in the same way.(Palmer 2008)*

This begs the question as to whether Australia can claim Bernacchi as their first polar scientist and expeditioner? Bernacchi himself had no doubt about his English patriotism in spite of a strong Italian heritage with Spanish and Flemish influences. Belgium may also have claims on Bernacchi to enhance that country's connection to Antarctica.

Bernacchi's interest in Antarctica seems to have been stimulated by his father's own intellectual interest in the sciences and discovery of Antarctica. There was also an event where, in 1896, the sealing ship *Gratitude* sought shelter in Prosser Bay adjacent to Maria Island. This small ship then owned by Captain Hatch of Invercargill was engaged in a sealing expedition to the sub-Antarctic Macquarie Island. The ship's master (Captain Barber at that time) apparently regaled Bernacchi junior with tales of adventure on the sub-Antarctic islands. (Cumpston 1968) This ship was wrecked later (1898) on Nuggets Beach at Macquarie Island. The scene was made famous by the Frank Hurley photograph (during the Mawson *Aurora* expedition) of the remains lying on the beach, surrounded by penguins.

2.2 "…that unmitigated fraud, 'Borky' "

Bernacchi's training in astronomy, meteorology and terrestrial magnetism at the Melbourne Observatory paid off. He applied successfully to join the British Antarctic Expedition funded by the wealthy English publisher, Sir George Newnes. The instigator and leader of this expedition was a half-English, half-Norwegian who had settled in Australia and who had joined the commercial whaling ship *Antarctic* as an unskilled general hand. Carsten Borchgrevink went ashore when the ship landed briefly at Cape Adare and later claimed to have been first to stand on the Antarctic continent.

Borchgrevink returned with the obsession to lead a small expedition to overwinter on the continent at Cape Adare. He realised his dream with the funding support (to the value of £40,000) of Newnes. Bernacchi had previously met Borchgrevink in Melbourne during 1897 when the latter was seeking funding. The *Southern Cross* was purchased and refitted. It was a small steam-equipped sailing ship, previously called *Pollux*. It was from a design by Colin Archer who designed and built Nansen's *Fram* but, unlike *Fram*, it was a conventional square-rigged ship.

The expedition was very well equipped. They took 53 of the recently invented Swedish Primus pressure stoves and sufficient, top quality food, sledging equipment and polar clothing. Preparations by all accounts were sound and thorough. (Crawford 1998) They embarked from England in August 1898 and, by way of Tasmania, arrived at Cape Adare in mid February 1899. The huts built to house the ten men of the overwintering party are still on the beach.

It transpired that management was not Borchgrevink's strong suit and there was much discontent and through the darkness of the polar winter. Nerves unravelled, crew were depressed and the work of the expedition ground to a halt. The landing had been at a good site for constructing huts, but a bad site for access to the hinterland of the Admiralty Range. The grade to the inland was impassable so sledge journeys were only possible on frozen sea ice. The seventy dogs bought at a cost of over £2000 were mostly unemployed, as were the two Lapp dog handlers. Notwithstanding those limitations Bernacchi made a good set of magnetic and other physical observations. William Colbeck (who returned to Bernacchi's life in 1903 as Captain Colbeck, in command of the relief ship *Morning* during the National Antarctic expedition) kept a meteorological log for the year. Short sledge journeys were made across the ice.

Hanson, the biologist died, apparently from a malaise picked up in the tropics (beri beri) during the journey, but was probably also scurvy related. He had done considerable good work in his discipline before the illness debilitated him. Upon return of the expedition a row broke out regarding the whereabouts of Hanson's scientific notebooks (given to Borchgrevink) that described all the collections for the British Museum. Borchgrevink handled the whole affair poorly and publicly through the correspondence pages of the London Times. The field notes never came to light, confirming his status as an enthusiastic but incompetent amateur. He was already out of favour with the scientific and geographic community as he has secured funding (by smooth talking) that many felt should have gone towards the evolving Royal Geographic Society and Royal Society expedition that later became known as the *Discovery* expedition. Bernacchi later wrote to his brother Roderick in February 1903 from the ice:

> *Thanks for the cuttings etc from correspondence between the British Museum & that unmitigated fraud 'Borky'. The publication of the 'Southern Cross' collections (which I suppose you have seen) seems to be a very large fly in his ointment. I see he has become an authority on "volcanic disturbances". The magnetic observations of the 'Southern Cross' have also been published by the Royal Society.*

2.3 Legacies of the *Southern Cross*

In spite of management by threat and confrontation, communication by written instruction during the polar winter, winter depression, near-mutiny and Borchgrevink's habit of sledging to a rock hut on the Duke of York Island (apparently to binge drink), there were some successes. This was the first expedition to over-winter on the continent, they collected some good meteorological and physical scientific data, they dabbled in other scientific disciplines and showed that it might be possible to keep a ship safe at that latitude allowing exploration to commence in springtime. The South magnetic pole was relocated, having shifted since Sir James Clark Ross' *Erebus* and *Terror* voyage of 1840. A furthest south (78º 50" S) had been achieved by a

modest sledging journey southward across the great Barrier from a location at, or near Balloon Bight.

> *For expeditions to come in the twentieth century, the experiences of the land party during the Antarctic winter, and the knowledge acquired concerning the technique of living and working in the region were invaluable. Of particular interest was it for explorers to know that dogs could be used here, and that is was possible to survive the continent's appalling extremes of wind and cold whilst pursuing scientific and exploring work.* (Swan 1963)

Although Borchgrevink had outmanoeuvred Sir Clements Markham with respect to funding, and somewhat shown him up by departing with a well-prepared expedition after a short preparation time, he had also left a legacy that could prove central to planning for Sir Clements' forthcoming *Discovery* expedition.

2.4 Fellowship and Authorship

Louis returned to England with the ship, arriving in June 1900 to some personal notoriety. He became a Fellow of the Royal Geographic Society, presented lectures and published papers on the geomagnetism, meteorology and topography of South Victoria Land. (Bernacchi 1901a) He was awarded the Cuthbert-Peek Grant of the Royal Geographical Society that allowed him to work on the geomagnetic data he had secured during the expedition. He rapidly worked to publish an account of the expedition and showed up Borchgrevink with its depth and quality. "To The South Polar Regions" was favourably reviewed in the London Times of September 26th, 1901.

> *Mr Bernacchi gives us a much more satisfactory idea of navigation through the ice pack than did Mr Borchgrevink. In the same way he conveys a much fuller and clearer conception of the life led by members of the expedition on Cape Adare..*
>
> *…profusely illustrated with wonderfully good photographic reproductions, sketches & diagrams…*
>
> *… commonplace sentiment might have been expunged…*

Louis was the photographer for the expedition and his book is liberally illustrated with his own images.(Bernacchi 1901b)

He had become a valuable asset to any future Antarctic expedition requiring a physicist.

2.5 Appointment to the National Antarctic Expedition

Bernacchi received letters of invitation from Scott and Markham to join the *Discovery* expedition in late July 1901. He replaced the initial choice of physicist, William Shackleton, whose services were declined on the grounds of an unfavourable medical assessment. He did so only after determining that the decision on Shackleton was final. Bernacchi had only been back from the *Southern Cross* about a year, but in that time had achieved a great deal in terms of publication, public speaking and mixing in scientific circles. Other officers received training in magnetic observations using the Kew pattern monofilial magnetometers. Bernacchi was already familiar with this type of instrument after his Melbourne Observatory training and experience at Cape Adare.

The *Discovery* was purpose built as a scientific research vessel. One of the key elements (especially from the point of view of the Royal Society sponsors) to be investigated was terrestrial magnetism. A magnetic observatory was built on the deck for observations at sea and within 30 feet of that observatory all materials used in the ship's construction were of non-magnetic materials. The shrouds of the standing rig were not seized with wire, no steel cables were used and no nails or other metal fasteners were allowed in that locality. Mattress springs were taboo and the wardroom upholstery buttons were made of lead. Also included were phosphor bronze stoves that were found inadequate to handle the heat of coal burning.

The magnetic research was to be part of a coordinated regime of observations between the Antarctic expeditions of Erich von Drygalski (the German *Gauss* expedition) and Dr Otto Nordenskjöld (the Swedish *Antarctic* expedition), on the 1st and 15th day of each month. Absolute observations were made every two hours over the 24-hour period on those days in synchrony with the other expeditions.

Armitage (Armitage 1905) describes the range of instruments in detail.

> *For the observatory there were two unifilar magnetometers, two Barrow's dip circles and the Eschenhagen self-recording apparatus. For other "shore work" (sledge journeys) and ship board observations there were a number of azimuth compasses, Fox circles, Lloyd-Creak dip circles and accessories. These were the zenith of quality instruments for the task of determining variation, declination and intensity.*

Bernacchi did not sail with the ship when it embarked. He travelled to meet Professor Eschenhagen at Potsdam Observatory near Berlin. There he became expert in the use of the Professor's new device that had been sent to Kew Observatory for testing, but without any instructions. This was a magnetometer that had a self-recording mechanism. By means of a clockwork drive, a drum with a roll of photographic paper was rotated. At intervals a

shutter opened exposing the photosensitive paper to a beam of light reflected off the suspended magnet, thus recording automatically the changes in terrestrial magnetism at the time. Developing the paper as one would a normal photograph produced a magnetogram, a permanent record of the magnetic conditions for the period of the observation. [Appendix III]

Bernacchi needed to calibrate this instrument by taking "absolute" observations with the Kew pattern instrument on a weekly basis, hence the need for two magnetic observing huts at the Antarctic base. The automatic recording magnetometers at Scott Base are still calibrated weekly in a similar manner.

Duncan (Duncan 1901-1902) later described the apparatus thus:

> *A work observation hut is now finished thare is some very fine Instruments inside it-fitted on a Bench is A machine for photoing Magnatic elements its rather a curio & as thare is only 3 of this particular kind made. One hear & 1 with the German ship & one in Hamburg.*

Bernacchi was now overseer of one of only three instruments that were the pinnacle of this technology.

2.6 From Potsdam to Christchurch

Bernacchi caught a fast steamer (R M S *Cuzco*) embarking at Marseilles (Yelverton 2000) on September 16th. 1901 bound for Melbourne. He learned that slow progress of *Discovery* (only making about 6 knots under sail and steam) meant that, in order to still carry out important magnetic observations at a high latitude below Australia, Melbourne would be bypassed. Bernacchi's trip via Melbourne was not wasted as there was business to arrange, forwarding equipment and stores (including the main expedition hut, observatory huts, the dogs, fur clothing, snow shoes and other vital items) that was to have been loaded at that port. Louis was given authority to spend against the balance of expedition funds in the control of Professor Gregory.

Bernacchi fortunately still arrived in Lyttelton with the equipment before *Discovery* arrived. He immediately commenced work with the eminent magnetician, Dr Coleridge Farr establishing the Christchurch Magnetic Observatory whose building still stands in the Botanic Gardens. This observatory was established as part of the network of southern hemisphere observatories for the period of cooperation between the various polar ventures.

Bernacchi became familiar with life in Christchurch and established friendships that endured. Mrs Rhodes, the wife of the Mayor made his silk sledging pennant. Royds describes a number of parties at the Rhodes' "ripping place". He also candidly notes that Mrs Rhodes is "awfully nice and very pretty."

Some of Bernacchi's descendants still live in the Canterbury district. Royds (Royds 2001) reports in his journal for November 29th. 1900

> *There is very little doubt, but that the place is laying itself out to do everything in its power for us.*

He continues over the next few days' entries to describe many kindnesses extended to the ship, including the offer of 250 sheep, most of which could not be accommodated. On arrival of the ship, Shackleton was sent to "Knock up" the postmaster, even though it was after midnight. Duncan reports:

> *…but on hearing the Discovery had arrived was only too pleased to oblige with any letters he had by opening the post office.*

The bluejackets were also entertained. Duncan notes the entertainments at the Sydenham Working Men's Club and that in Christchurch,

> *Everything is Discovery.*

Skelton later married Sybil Meares, the daughter of a family that hosted the officers. A number of "Discoverys" settled in New Zealand later in life.

2.7 Return to Cape Adare

Embarkation from New Zealand and the initial explorations of the *Discovery* in Antarctic waters are outside the scope of this work and are well described in Scott's Voyage of Discovery narrative. (Scott 1905) The first Antarctic landing at Cape Adare is of note.

Cape Adare was the location of the *Southern Cross* expedition that overwintered on the continent in 1899. It was of significance to the scientific work to revisit and secure another set of magnetic data. It was known that the magnetic pole was not fixed and a new set of data could inform the rate and direction of movement since Bernacchi had taken the initial observations. Armitage and Bernacchi landed (January 9th. 1902) to take magnetic observations while some of the crew were allowed ashore also. The huts were still in good condition and Royds describes the letter left behind by Borchgrevink as follows:

> He had left a letter *for the "Commander of the next expedition" and it was absolute rot. No information of any sort, and quite the last sort of letter one would expect one leader to write to another.*

Arrival at Cape Adare was the first point at which Bernacchi's previous experience in Antarctica became evident to the wider crew. Men had ascended the hillside to visit Hanson's grave but had been unable to locate it. Bernacchi landed again later in the evening and led a group to the location of

the grave. Duncan (with a shrewd carpenter's eye) determined that the huts at Camp Ridley were superior to those provided for the *Discovery*.

Scott (Scott 1905) describes their first continental landing as follows:

> *We could only wander about and imagine the daily life of the party until our physicist, Mr. Bernacchi, joined us. This officer had been one of the small party of eight souls, and here on the spot he recalled the past and told us of the unhappy death of one of his comrades, the naturalist Hanson, now lying buried on the hill-top 1000 feet above our heads..... Our energetic magnetic observers, Armitage, Bernacchi and Barne, were soon at work with their instruments amongst the penguins, whilst the naturalists wandered further afield in search of specimens.*

2.8 Arrival in Winter Quarters-establishing magnetic observatory

In spite of Bernacchi's attempts to convince Scott to overwinter at Wood Bay (probably related to proximity to the magnetic pole), he is clearly impressed by the surroundings of their selection at Hut Point (77° 51'S, 170° 09'E):

> *Huge dark columns of smoke rose up over 1000 feet above the crater & curling down rolled in the direction of Mt Terror. The sun, almost directly behind the mass of dense smoke gave it a most fiery & gorgeous* appearance.
> *The sight of this stupendous burning mountain amid the eternal ice and snow is most imposing & impressive & in the dark winter night it must be most weird & beautiful.*

It was an ideal location. The ship was in the lee of the prevailing south-easterly winds, Hut Point protected the ship from any ice pressure, there was solid land adjacent to the ship for the huts, and it was a very high latitude, ideal for the next season's bid to sledge southward. The hinterland was not entirely snow covered so there was the possibility of geological work. Seals were abundant, so stocking the larder for dog and human consumption was possible. Scenically there was nothing to compare with the views of Mount Erebus on one side and the Transantarctic Mountain Range across McMurdo Sound.

The critical first tasks were to unload the ship of enough survival equipment and stores to sustain a shore party in the event that the ship was blown from its moorings (as happened later to the Ross Sea Party of Shackleton's *Endurance* Expedition). Also, the ship was bumping on the bottom, so removing weight, and redistributing it forward was critical. (Royds 2001) Landing the huts and constructing them were high priorities. First was to provide shelter and the second to allow scientific work to commence, especially the magnetic "Term Day" observations. It was Sunday February 9th. The term day of March 1st. was fast approaching. Surprisingly, in spite of the urgency to make progress with getting everything snug while the good weather held out, there was still time for football on the ice and skiing.

Gregory Villa, the expedition living hut, was designed as an outback-Australian squatter's (landholder's) dwelling. It was considered very unsuitable for polar work and was universally disliked by all the expeditions that had occasion to use it. In spite of small, double-glazed windows it was impossible to keep warm, even by the use of a regular stove within. This was a major investment of the expedition at £356, almost equivalent to Scott's annual stipend from the Navy as a Captain and more than the annual expedition wage of most of the officers and scientists.

The two (magnetic) observing huts were ordered from Germany and were timber framed with asbestos lining. It was important to maintain an even temperature in the huts for the instruments so it transpired that Bernacchi's huts were major users of heating oil.

Armitage and Bernacchi were assembling the magnetic observatory huts themselves, and Duncan (Carpenter's mate) sarcastically writes on February 20th.:

> *Mr Armitage & Mr Bernachie is started to build one of the observation Huts. They are framed & then covered with asbestos very simple when the way is known. The builders don't seem to make much headway!*

And then a couple of days later adds:

> *…Dailey has got to put the observation Hut straight they having lost the Key or don't understand the jobs…*

Baughman (Baughman 1999) comments of the main hut construction and use of dogs:

> *Building the hut was a considerable task. The dogs were used, for the first time, to help bring up some of the sections of the pre-fabricated structure, but Scott thought the dogs "young and untrained and haven't any idea of their duty." Scott's sense of naval order ran afoul of the dogs, who were a "terrible drawback to anything like cleanliness and render the condition of life aboard almost unsanitary."*

The assembly of the huts was completed on March 18th. according to Duncan but Bernacchi reports the second hut complete on April 9th. The difference may be contrast between completion of the hut fabric and actual readiness for magnetic observation work.

2.9 The importance of status

Bernacchi was the only member of the ship's company that had experience in Antarctica. He was one of only three members with any polar experience. Albert Armitage (second in Command) had been with the 1894-97 Jackson-Harmsworth Arctic expedition as had their colleague Dr Reginald Koettlitz.

I believe that Bernacchi had a healthy self-esteem, possibly to the point of arrogance. I think his messmates probably perceived him as being somewhat uncouth, not having had an English public school and Cambridge-style education. Louis was already established as a successful scientist, polar expeditioner, author and speaker. Bernacchi (rightly) believed he had a position of some status. He was well read, well spoken, well educated, a linguist and on the way to becoming a gentleman. In an (undated) press clipping, probably about 1910, he is described in the London Times as a thinker and philosopher. (Palmer collection)

The expedition leader thought otherwise and failed to treat the experienced members of the enterprise with due deference. I believe Scott failed to take advantage of the body of knowledge and experience represented by Armitage, Bernacchi and Keottlitz.

Analysis of the objectives of the expedition and focus on a number of critical events, as described in diaries and narratives follows in support of this opinion.

3 : "Deeds of Derring Doe"

3.1 Objectives-conflicting agendas

Sir Clements Markham (the father of the expedition) makes it quite clear that (for public consumption anyway) there are two main aims of the enterprise. Geographical exploits are the main game (in particular proving whether Antarctica was a continent or an archipelago of islands), with science as a supplement. Markham however tells us that the expedition was a platform for the advancement of ambitious young officers. (Markham 1986)

I claim also that he believed the means to that end was to bring back the glory days of arctic sledging using antiquated practices such as manhauling. He was able to achieve this to a great extent though direct influence on Scott. He wrote when planning the expedition:

> *The main object would be the encouragement of maritime enterprise, and to afford opportunities for young naval officers to acquire valuable experiences and to perform deeds of derring doe. The same object would lead to geographical exploration & discovery. Other collateral objects would be the advancement of the sciences of magnetism, oceanography, meteorology, biology, geology; but these are springes to catch woodcocks. The real objects are geographical discovery, and the opportunities for young naval officers to win distinction in time of peace.*
> *The expedition must, therefore, be a naval expedition or, if an unenlightened Government is obdurate on this point, an expedition with as strong a naval element as possible. (Markham 1986)*

There was a famous round of intrigue and manoeuvre during the planning stages of the expedition. These have been dealt with at length elsewhere

(Yelverton 2000) (Baughman 1999) so are not the subject of this paper. The outcome was that Markham had successfully engaged the Royal Society at the outset, gaining considerable prestige, and therefore enhanced fund raising capacity, especially with the treasury. He had then dispensed with Professor Gregory as leader of the Expedition. Gregory was an experienced scientist and expedition leader who was eminently suitable to lead the enterprise. Markham made his involvement untenable causing him to withdraw, leaving the way clear for an almost exclusively Royal Navy affair. Markham clearly states his preference for youth over experience and won through with the appointment of Scott as leader of the entire expedition, not just the maritime component. This mechanism allowed elements of the scientific agenda of the expedition to be placed in control of non-scientists, or to be excised.

Items 2 and 3 of the "Instructions to the Commander" of the expedition (reproduced at Appendix I in Yelverton) state:

> *2. The objects of the Expedition are a) to determine, as far as possible, the nature, condition and extent of that portion of the South Polar lands which is included in the scope of your Expedition; and b) to make a magnetic survey in the southern regions to the south of the 40th parallel and to carry on meteorological, oceanographic, geological, biological and physical investigations and researches. Neither of these objects is to be sacrificed to the other.*
>
> *3. The scientific work of the Executive officers of the ship will be under your immediate control, and will include magnetic and meteorological observations, astronomical observations, surveying and charting, and sounding operations.*

The instructions then continue to make reference to a director of the civilian scientific staff, who was no longer part of the expedition. It's no surprise that confusion resulted between the roles of scientific staff and ship's crew. It is also plain to see that the scope of this responsibility is too great for a person with no expedition leadership or scientific experience.

In a nod to the involvement of the Royal Society the focus would appear to have been on science (in particular magnetic science), especially through the winter. When spring brought on the opportunity to go sledging, the focus shifted completely to geographical exploits.

3.2 Chivalrous deeds

Markham's preoccupation with constructing a foundation for young officers to show their worth is an element that promoted failure during Scott's *Discovery* and the later, fateful *Terra Nova* expeditions. He still believed in bold deeds, chivalry and manhood. Scott absorbed those opinions. Although the sledging journeys were essentially maritime affairs but on frozen, not liquid water, there were elements of the crusades in the background. Markham was obsessed with the provenance and family connection of the officers (and even many of

the bluejackets). Notwithstanding the obsession, he made mistakes as evidenced by two errors in his entry for Louis Bernacchi.

The influence of heraldry was there. He designed sledging pennants and coats of arms for members of the sledge teams. He drew illustrations of family shields to accompany his personal notes on staff.

Bernacchi (1902) describes the provenance and design of his sledging pennant [illustrated at Appendix II] thus.

> *One lady. A Mrs A E G Rhodes, wife of the Mayor of Christchurch kindly made me a most beautiful sledging pennant. The base of the flag is the red St George's Cross on a white ground & the body of the flag a deep blue in the centre of which are the white stars forming the constellation of the "Southern Cross" (Crux) beneath which is a Maori motto Rapua, Rapua, kakitea*

Markham (1986) gives a thorough description of the pattern and elements of the sledging pennants. This passage resonates with the concept of chivalry and English masculinity.

> *The Knights of Chivalry used flags (called standards) with the Cross of St George always on the hoist. This was to denote that whatever family the bearer may belong to, he is first and foremost an Englishman. The fly is divided per fess (horizontally) with the colours of the arms, edge fringed of bordered of the colours of the arms alternating over all the crest or principle charge. Swallow tailed. Extreme length 3ft 2 1/2 in, from head to split of swallow tailed 2ft 2 in. Cross of St George 12 inches square, width of cross 1 3/4 in.*

Markham's attitudes probably reflected those of his predecessor in the presidential role at the RGS, Sir Roderick Murchison who stated that Arctic exploration:

> *Provided publicity for the RGS…strategic benefits for Britain, and peace- time exercises for the Royal Navy.* (David 2000)

Bloom (Bloom 1993) highlights the importance of the Royal Navy aspect to the expedition.

> *A whole ideological system of entitlement to rights had been erected on the assumption that certain military virtues such as courage, bravery, and manliness were innate qualities of British subjects in the Royal Navy. It now mattered less whether these men were no longer part of the upper class, for their affiliation with the Royal Navy bestowed on them the requisite authority and prestige.*
>
> *In keeping with the attitudes of the Royal Navy during this period is a reconstruction of the past, or the literary attempt to transport the past fictionally into the present, of which Markham's writings are one example.*

Petty Officer Duncan notes in his journal for September 19th. (Duncan 1902) that the sledge party returning from the South.

> *…looked like warriors, all covered in snow and ice.*

Interestingly, after the return to England of the expedition, the sledging pennants and flags were central attractions in displays of memorabilia. Sadly, Bernacchi's sledging pennant is believed lost during a burglary.

The use of dogs to haul sledges was possibly seen as some sort of moral and physical weakness by polar traditionalists. Yelverton notes that during preparations for the expedition, and after discussing the matter with Nansen

> *… Scott was in favour of dogs, the resistance coming from Markham.*

The Antarctic Manual, a compendium of all information thought useful to inform the expeditioners, compiled by Murray of the Royal Geographic Society (Murray and Royal Geographical Society (Great Britain) 1901) contained accounts of McClintock's 1850's sledging journeys where the use of dogs was incidental. This was an example of the pluck and courage in sledging practice that Markham seems to have upheld as the ideal of manhood and virility.

The metaphor of "Conquering the pole" is a recurrent theme that reflects a "man versus nature" theme of exploration in general, and polar exploration in particular. It is a virile, manly undertaking to challenge nature and win out. Bloom (1993) reflects that exploration as a white, male dominated activity helped to maintain the social hierarchy (especially in the face of evolving women's suffrage and expanding rights). She further highlights that

> *…polar exploration was seen as a testing ground to keep alive displays of moral courage and physical bravery, as well as a place to express the superiority of the British race.*

Nansen in his preface to Armitage's "Two years in the Antarctic" recommends the inspirational value of the narrative:

> *…may it find its way into many an English home, and, read at the fireside, may inspire many a young man to noble deeds, whether the battle be fought in the bustle of great cities or the silence of those icy regions where men toil on the drag-ropes of a heavy sledge for the advancement of human knowledge.*

Certainly courage, bravery and manliness were character traits required for polar exploration. More was required however. Knowledge, skill, technological savvy and strategic management were also required to meet the challenges thrown up by Antarctica's natural elements.

Scott fulfilled Markham's agenda, that of providing heroes for the British public, by perishing tragically in 1912.

3.3 Scientists as Heroes

Sledge journeys, especially those that discovered new territory, solved geographic mysteries or gained a new highest latitude provided great caché to their leaders and crew. I maintain that Antarctic science in 1902 was no cakewalk either. Certainly there is no comparison with some of the appalling tales of deprivation and hardship from the far southern journeys, but it is unjust that scientists who endured significant hardship in the interests of data gathering received little recognition.

The work of Royds, Barne, Ferrar and Bernacchi continued through the winter months. Those undertaking physical and meteorological observations were frequently working in exposed, extreme sub-zero conditions.

Markham wrote to Bernacchi in September 1903 in praise of solid scientific work in the face of hardships.

> *My Dear Bernacchi*
>
> *You will be the only person who ever passed three winters in the Antarctic regions, and there are certainly very few who have done such diligent painstaking work for science in the face of such tremendous difficulties. I hope to hear that you have got well through this last winter and not without being able to add to your record of valuable work done.*
>
> *… Your diligence, in the midst of so many hardships and difficulties deserves the highest commendation. Your constancy to the magnetic work denies you to some extent of the interest you would have derived from sledge travelling; yet you had a trip with Armitage over the ice barrier*

Bernacchi's 1902 diary entry for July 16th & 17th describes winter conditions:

> *Had contemplated starting gravity work & undertaking astronomical observations for rate of sidereal chronometer but the persistent bad weather makes it impossible.*
> *… All the meteorological instruments outside were soon covered up with the exception of the Robinson anemometer which indicated 85 miles per hour for 12 consecutive hours.*

During those blizzards Bernacchi was the only crewman allowed off the ship. Even meteorological observations were suspended. Bernacchi had to crawl between the ship and the hut. The blizzard described filled the magnetic hut with snow again, that had to be painstakingly removed from around the delicate instruments within. Royds reports temperatures down to -32°F around these dates.

In addition to the requirement to continue working in extreme cold, endurance was also required. Bernacchi had an awful string of responsibilities to acquit at the end of July 1902.

On The 31st. he had been working in the main stores hut (nicknamed *Gregory Villa* after Professor Gregory who organised this inappropriate structure from Australia for the expedition) with Skelton taking pendulum observations. These observations were carried out within a vacuum apparatus in order to determine the value of Gravity locally, and thus determine the extent to which the earth was oblate. Each set of observations took many hours as there were three pendulums, each of which was swung for two hours before being turned around on the fulcrum for replication. They finished in the evening and became lost in a blizzard for about two hours whilst returning to the ship. They could have easily perished. Bernacchi reports in his diary for August 1st.

> *Feeling rather stiff after last night's experience. Face frost bitten and large water blisters have formed on the wrists. Succeeded in finishing the pendulum observations about 1am.*

In other words, in spite of having nearly perished in the blizzard and being frostbitten, he had returned to the Villa and completed his pendulum observations.

To compound matters, August 1st was a magnetic term day. On term days it was arranged that certain observatories in the southern hemisphere (Christchurch, Hobart and Capetown) and the shipboard Eschenhagen magnetometer under the control of Bidlingmaier on the *Gauss*, would simultaneously take a series of records involving 24 hours of continuous attention to the instruments, and for one hour of that time, taking 180 manual readings at twenty-second intervals. Bernacchi generally stayed in the magnetic observatory hut for the nights of the term days. Another complication was that the paraffin lamps used in an attempt to keep the hut at a constant temperature often went awry covering the hut and instruments in a layer of soot. Bernacchi seemed to be perpetually cleaning either soot, or snow from within the magnetic huts.

As the Drygalski's ship *Gauss* was frozen in to an ice floe, Bidlingmaier had his magnetic observatory set up on the ice. The weight of stores and the hut caused the floe to gradually sink and as the temperature in the observatory had to be kept constant there was a great deal of liquid water about. Bernacchi was lucky that his observatory was established on solid ground. Bidlingmaier had to take the term day observations standing in sub zero water on the floe! (Yelverton 2000) .

Bernacchi continues his diary to show that August 2nd. was his turn for night watch meteorological observations (that included travelling out to the weather screens on the ice behind the ship):

> *…My night duty. very unpleasant was Temp -21°& wind at times above 40 miles per hour with drifting snow.*

Later in August Bernacchi took the opportunity of the polar night to take some star sights in order to rate the chronometers (determine the amount by which they were gaining or losing time) and to better fix the latitude and longitude. He writes:

> *…took some transits of stars with portable Transit Instrument for rate chronometer but it was terribly cold work in a temperature something like*
> *-45°F.*

Frostbite was a constant risk for other scientists too. Royds frequently reported frostbite on his fingers:

> *Went through the usual agony this morning in shifting the recording papers, and my fingers are still sore from the cold metal. (July 14th. 1902)*

Barne and Hodgson were not immune to work related frostbite either. Both continued to work through the Antarctic winter at holes in the ice. Hodgson had fish holes, down which he sent trawls to catch benthic fauna. He was constantly handling icy specimens as they had to be preserved quickly before they cooled further by exposure to the air and became brittle. Barne was sampling deep water from the Sound so had similar constant contact with iced water.

Koettlitz was not engaged in outdoor work. His interest lay in the microbiological world, especially from within the viscera of penguins and seals. We now know why Koettlitz was obsessive about microbiology. A letter to Bernacchi (August 10th. 1905. Palmer Collection) after the expedition reveals (I believe for the first time) his motivation for this work:

> *…of course it is highly probable that one of these days something may be learnt as to the origin of life, and life may be produced in the laboratory.*

Ferrar, the expedition geologist was credited with having the best knowledge of any crewmember of the Hut Point locality. Throughout the winter he continued daily geologising walks.

Antarctic science in 1902 was extremely challenging in spite of the availability of the floating laboratory and hostel known as the *Discovery*.

3.4 Confused roles

I believe that the management of the expedition was confused. Prior to embarking the conflict between the partners sponsoring the expedition had

left matters unresolved with respect to roles and responsibilities. Scott became expedition leader and solely responsible, although guided by the Antarctic Manual (Murray and Royal Geographical Society (Great Britain) 1901) and Markham's influence. Competent as he was in some elements of his craft, he was ill equipped to lead such a complex enterprise. He came from an institution with a rigid management structure that couldn't cope with the many and various demands. It is significant that although the Discovery was not Royal Navy (registered as a Steam Yacht, not H.M.S.) there was a convenient fiction maintained by everyone. Naval discipline and hierarchies were entrenched. Like all those selected by Markham he was young and unseasoned, with little relevant experience for the job at hand. The debate about Scott's competence has been thoroughly aired elsewhere (Huntford 1979) and I believe remains unresolved.

Why was there some much overlap between the work of the scientists and the officers? The expedition instructions confuse the roles (see above) nominating some of the scientific duties to be undertaken by the ship's executive officers. It was partly (I suggest) there was a great deal to do. Alternatively, it might have been about maximising the number of naval staff and keeping the number of "idlers" (supernumeries) to a minimum.

Armitage was responsible for magnetic observations at sea. This turned out to be highly appropriate, as Bernacchi did not make the passage to Lyttelton on Discovery. At sea Michael Barne undertook the deep-sea water sampling. Once established in Winter Quarters, the meteorological program was under the complete control of Royds. On the ice Shackleton spent his time testing water and ice for salinity.

3.5 Fame or obscurity?

I believe the expectations of the crew and scientific staff of the Discovery went unrealised upon return of the expedition. Scott personally did well, being decorated by the King and fêted extensively. The idea that the older naval veteran, Markham, was mentoring young officers during a time of peace (and therefore having only glacial promotion prospects) was only one man's agenda I believe. Advancement was achieved in the case of Scott, but is doubtful for other members of the crew.

The expedition was partially successful in re-establishing Britain in a pre-eminent position with respect to naval supremacy and geographic discovery. The expeditions of von Drygalski (*Gauss*), Nordenskjöld (*Antarctic*), Bruce (*Scotia*) and Charcot (*Pourquoi-pas?)* also operated in the Antarctic between 1901 and 1905. They were civilian scientific expeditions that had varying success. Nonetheless the notoriety of the *Discovery* must have been diluted by the news of so many expeditions returning. Markham's other agenda was partially fulfilled.

The *Discovery* expedition ended badly in terms of public relations with the funding bodies. The government finally took over the management of the

whole relief effort and sent unequivocal orders to abandon the *Discovery* if it was not freed from the ice.

The government took over ownership of the *Morning* that was being refitted in New Zealand for a second trip South. It also prepared and sent out (at great expense) the *Terra Nova* under the control of the Scottish whaling Captain McKay. McKay was an experienced polar navigator and icemaster.
I subscribe to the view that the *Discovery* would never have been released form the ice at Winter Quarters if not for the McKay's skill with explosives, his superior seamanship and the ice breaking power of the Terra Nova. (Aldridge 1999) Certainly the process was critically assisted by the final, large swell and wind conditions that allowed the ice to break out.

The final outcome was that, in spite of solid science and geographical explorations that helped fill in large unmapped tracts, the crew of *Discovery* were unpopular with employers and the admiralty (whose officers and men had spent considerably longer away from their active duties than was ever anticipated). This, I believe is a direct result of Markham's mismanagement of funding matters, and the need to make successive requests for government financial aid for relief of the expedition. It was a marvellous rebound for Markham and Scott to restore their credibility enough to get funding, not ten years later for the *Terra Nova* expedition.

It does not seem to be public knowledge that the scientists were universally treated in a shabby manner upon return of the expedition.

In a letter to Bernacchi after the end of the expedition Sir Clements advises that it would be Scott's choice as to where the magnetic observation data ended up for reduction and interpretation. I find this to be an amazingly dismissive statement considering the circumstances. Although Scott eventually became expedition leader he only learned science from the specialists in his employ. The involvement of the Royal Society and the Admiralty's hydrographic department seemed to be at odds. Surely it was not Scott's prerogative to decide the fate of the scientific collections? This treatment would have been highly offensive.

Bernacchi (reasonably) expected to get some employment at conclusion of the expedition "reducing" the results. Scott wrote to Bernacchi in January 1905 stating the belief that surplus from sale of the expedition ship should go to support analysis of the scientific work. In a letter from the Falklands in July 1904 (Palmer Collection) Bernacchi writes to his brother Roderick (Dick)

> *…We expect to get home about Sept 15, 1904 then I suppose I shall be pretty busy for next year or two as we have an enormous amount of scientific work to prepare for publication.*

Commander Chetwynd of the hydrographic Department of the Admiralty was the figurehead with respect to terrestrial magnetism and navigation. He wrote to Bernacchi in September 1904.

Dear Bernacchi

Many thanks for your…list of observations. The heaviest work of course is the reduction of the 600 magnetograms. How long do you think that would take?

Shortly afterwards (October 5th) he backs away from the implied offer.

Dear Bernacchi

I regret to say that it has been found financially impossible to arrange for the reduction of observations as you suggested.

Whatever arrangement is made will probably be independent of me altogether & therefore I must leave the matter in the hands of others.

This is not the first or last case of conflict over research results, intellectual property or the expense of processing scientific data after the fieldwork is complete. Bernacchi must have ultimately come to some arrangement as Sir Clements Markham wrote (February 1905) that he would put it to the Joint Financial committee (presumably of RGS and RS) proposing an allowance of £38 per month until all the expedition work was finished. Bernacchi wrote to his brother Roderick in January 1907 stating that he was busy with Discovery scientific work that the Royal Society would be publishing that year. Bernacchi had commenced his involvement with rubber plantings by that stage but probably still needed regular income to support his financially challenged family.

It transpired that Bernacchi eventually had to get his solicitors to threaten Cyril Longhurst, the expedition secretary, to get back-pay owed him from the main expedition work.

After return of the *Discovery* the Royal Society seems to have dissociated itself from the enterprise. Bernacchi was apparently also hoping to get some standing with the Society and was rebuffed in spite of support of various luminaries. The following letter (Palmer Collection) from George Murray (of the British Museum of Natural History) to Bernacchi in January 1905 explains the situation.

My Dear Bernacchi

I forgot to say I put your certificate up for the Royal, signed by men like Kelvin, Rucker, Creak, Ayrton etc.

I shall use all the influence I have, but you must not expect much at once.

Yours Very Truly

George Murray

Bernacchi did mix in society after his return from his travels. He was invited to Buckingham Palace at least twice (1927 and 1934) and enjoyed membership of London clubs (Athenaeum and Reform), fenced at competition level and maintained an involvement with scientific circles and Antarctic events. He was

variously decorated with an O.B.E (Mil.), the U.S. Navy Cross and the French Cross of the Legion of Honour. (Swan 1963)

Koetllitz sums up the situation in a letter to Bernacchi from South Africa in August 1905. (Palmer Collection)

> *I am quite of the same mind as you with regard to disgust as to the way we of the scientific staff have been treated, as of the unfairness of the contrast between Captn. Scott's treatment and ours, but, I differ from you, and am therefore the happier, in that I expect it and you apparently did not. I have been on three expeditions now and the first two gave me the experience which taught me.*
> *That I should be given no say, or voice as to my own collection, not to say a real chance to work some of them out, is a little worse than expected and it has disgusted me a little. I have quite washed my hand of everything to do with the expedition now and did so even before I left England. Here also nobody can get at me or trouble me.*
> *…I fear you can do nothing with regard to showing up our treatment.*

Sadly, Koettlitz and his wife died within two days of each other in 1916 after contracting typhoid in the Transvaal, where they had lived since leaving England.

It wasn't just the scientific staff that felt disadvantaged after the expedition. Reginald Skelton who had received extensive praise from Scott for his marine engineering and other perpetual work on scientific instruments, sledging gear and other follies (like the Scott's windmill project) in Winter Quarters (Skelton 2004) writes to Bernacchi in January 1905 saying:

> *I went up to the Admiralty today to tell them I was ready for service but they didn't seem to think the "efficiency of the Navy depended upon me"-as they ought to do.-I'm afraid the Admiralty won't do much for people like myself who cannot get powerful people at their backs-of course it is always a matter of "fitting"-I suppose I am not fool enough at "sugar sucking" but I'll be damned if I go asking favours of anybody.*

Michael Barne, a key figure in the achievements of the Discovery expedition reflected to Bernacchi in 1938, when asked to write a biographical sketch for the forthcoming *Saga of Discovery* Publication.

> *Dear Bunny*
> *As regards my own illustrious biography, I fear I can't make 200 words of it: as I have done absolutely nothing of any note al my life.*

Barne had been especially selected by Scott to accompany the expedition. His comment may have had a touch of false modesty as he became a Captain and was master of two warships in the first war and was awarded a D.S.O., but it does have a tone of disappointment about it.

These examples of ill treatment have come to light in spite of what Armitage wrote in the preface to his narrative of the expedition. (Armitage 1905)

> *The Admiralty promoted our Commander to Post-Captain, and Admiral Sir Lewis Beaufort informed the other Royal Navy officers of the expedition that their interests would be looked after.*

Shackleton, although from the merchant marine service, had been granted a commission in the ”Wavy Navy” (Royal Naval Volunteer Reserves) when he joined *Discovery*. In spite of a solid career prior to the expedition as mate and officer on various ships, he lurched between inadequate appointments after Scott repatriated him. He tried journalism and then became secretary of the Scottish Geographical Society on modest wages. He tried to get into parliament unsuccessfully before getting work with William Beardmore's engineering works. His return to Antarctica with his own *Nimrod* expedition came about primarily through this connection and was not related to any achievements or status related to the *Discovery*.

One condition of joining the *Discovery* expedition was agreement that publication of official accounts of the expedition and communication with the media were the exclusive right of the expedition, and no narratives could be published until six months had passed after publication of Captain Scott's official version. Armitage managed to publish his unofficial account late in 1905 (about the same time as Voyage of *Discovery*) (Scott 1905) (Armitage 1905) in spite of that directive. Bernacchi wrote to Scott and Markham (separately) asking permission to also do so. He was of course rebuffed (Scott to LCB, Dec 2nd.1904. MS 276, Item 45. Cant. Museum, Markham to LCB Dec 3rd, 1904, Palmer collection). Bernacchi eventually published his account as part of his monograph *Saga of the Discovery* (Bernacchi 1938) where he gives a fair history of the ship and some elements of the National Antarctic Expedition. He was already writing draft content for this account upon his return in 1904. Interestingly it is in these rough notes (Palmer collection) that Bernacchi we learn the origins of his interest in Antarctica He was clearly encouraged by:

> *…my father, who was a great Antarctic enthusiast.*

Some crew took up lecturing. Bernacchi was put forward in January 1905 by Markham to travel to Paris (expenses paid) to lecture to an elite audience. Mme. Charcot wanted to engage one of the “Discoveries” to give an Antarctic lecture in her salon (in French). Her husband would have still been in Antarctica. Bernacchi accepted.

Michael Barne noted in a letter to Bernacchi, also in January 1905

> *The Pilot is still lecturing. Went to see Charles as a debutant, also Ferrets. When are you going to display your leonine proportions before the R.S…?*

This refers initially to the Pilot (Bert Armitage) who must have continued on leave from his employment with the P & O Company. “Charles” would be Charles Royds and I can only assume that “Ferrets” is an otherwise unknown nickname for Hartley Ferrar, the geologist from the *Discovery*.

In summary, most of the *Discovery's* probably suffered disappointment in their post National Antarctic Expedition careers. Scott returned as a minor hero who only achieved greatness posthumously.

4 : “Scarcely and Exhibition of Control”

4.1 Experiments

Scientific enterprise was not the only area of experiment. Nearly all activities in the first year of the *Discovery's* stay at McMurdo Sound were experimental, particularly those that were related to polar survival or sledge travel.

The National Antarctic Expedition was a civilian enterprise, financed by public subscription, government donation and sponsored by the Royal Society and the Royal Geographic Society. In spite of that background it was run as an entirely Royal Navy enterprise. That Naval background brought with it an inappropriate management structure that was slow to adapt to changing circumstances and slow to learn and implement lessons from experience on the ice.

The *Discovery* expedition was the most lavish and carefully prepared expedition of its type ever. The expedition ship, a research vessel, was purpose built with scientific (mainly magnetic and oceanographic research in mind) and the first ever built specifically for scientific enterprise. This chapter highlights that in spite of years of preparation (especially on behalf of Sir Clements Markham), and the early appointments of many staff to the expedition, there was a considerable shortfall in areas of basic preparation and knowledge. I contend that the scientific work was achieved in spite of the other shortfalls. I further contend that the scientific work had its own style of heroism that could not compete with the geographic exploits in the view of the public.

This chapter discusses and analyses a few events that demonstrate that naïve optimism is not always sufficient to carry the day. Learning critical survival skills for polar explorers was being carried out by trial and error, and without any systematic order to allow the learning to be applied efficiently.

Borchgrevink may have been an enthusiastic amateur and a bounder, but reflect on his excellent preparation with respect to acquisition and handling of dogs for transport, and in particular his understanding of the numbers required for load hauling. He took specialist dog handlers. How could Scott have justified the appalling shortfall in knowledge in this matter when he had many informative resources available?

4.2 "The Only Intelligent Transport"

Bernacchi wrote in Saga of the Discovery (Bernacchi 1938) that:

> *The only intelligent transport was by dogs*

And:

> *Sir Clements Markham was inexorably opposed to using dogs as beasts of burden. He found nothing incongruous in letting man take on that role*

In mid February, soon after getting snug at Winter Quarters, conflicting opinions about how to conduct dog-sledging operations resulted in a "competition" (no doubt attended by betting) between Bernacchi and Armitage. Each trained up dog teams using different methods and different technologies for the equipment. Bernacchi won the race, but without any control of the team. He claimed complete victory. Different accounts report the event variously.

It is often stated that history is written by the victors. What follows is Bernacchi's own journal account of this enterprise.

February 16th, (page 112)

> *A discussion arose at dinnertime upon dog training & driving which resulted in my entering into a competition with Armitage to each break in a team of dogs after his own fashion. The later contended he would have his team in hand before I would mine He was to use expedition harness, muzzles and whips. Whilst I was to make my own harness & use neither whips now muzzle.*

Royds (Royds 2001) writes for February 18th.

> *The former is driving them by means of a whip and hard treatment whilst the latter is using soft words and coaxing.*

Heald (Heald 1901) only notes at February 18th.

> *Mr Armitage and Bernacchi trying the dogs in sledges.*

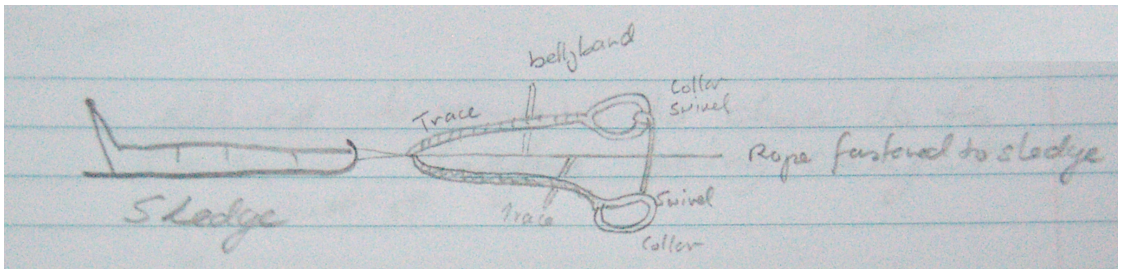
In reality Armitage clearly had the upper hand, having spent from 1894 to 1897 in the Arctic and, as Yelverton notes, having sledged over 300 miles with Frederick Jackson. (Yelverton 2000) Although Bernacchi had overwintered with the *Southern Cross* expedition at Cape Adare, the camp (named "Camp Ridley" after the maiden name of expedition leader Carsten Boschgrevink) (Borchgrevink 1980) was unfortunately sited adjacent to an insurmountable grade up to the Admiralty Mountains. Intended sledge journeys to the interior were not possible and sledge journeys across the sea ice were nominal (and not science related) in spite of the acquisition of ninety

Greenland and Siberian dogs who were attended by two Lapp grooms. (Bernacchi 1901)

Lashly notes (Ellis(ed) 1969)

> *To the accompaniment of wild cheering from the spectators Bernacchi's team won easily. Armitage, the advocate of force never got started at all.*

The following diagram is an accurate reproduction from P114 of the 1902 journal to illustrate Bernacchi's own harness design.



Bernacchi continues the description. (February 18th.)

> *The sledge competition came off today & my team of 12 dogs were victorious. The harness employed appeared to have some advantages over that used by Armitage. Had my dogs harnessed as follows two abreast to the long rope attached to the front of the sledge. A broad canvas collar fitting well down on to the breast at the bottom of the collar a trace made fast & running in between the legs: A belly band to keep the trace in position & a short line with a swivel at one end attached to leading rope & hooking into the collar to keep pairs of dogs abreast.*
> *The harness of the other team was more complicated Was made in one piece but kept continually fouling the dog's legs so frequently that they had to run along on three legs only. They were not fastened abreast but one in front of the other on alternate sides of the rope. Many of the dogs are young & not broken in to harness.*

Scott's narrative (Scott 1905) notes that

> *Armitage selected all the fighting element, whilst Bernacchi's team were mostly the younger timider dogs. At first neither team could be got to start at all; there was wild confusion of twisted traces and some exciting fights; but eventually amidst the cheers of onlookers, Bernacchi succeeded in coaxing his animals into a trot, and, heading up the steep snow-slope left the driver breathless behind. Whilst this was scarcely the exhibition of control that had been intended, the other team had refused to trot at all, and the honours of the day of necessity given to the advocate of gentle persuasion.*

Armitage omits reference to this event in his narrative, although he does provide insight to dog management (Armitage 1905)

Yelverton states that the outcome of the competition was sadly revealing. This is in reference to the state of knowledge and skill required. He also notes that this is the point at which Scott realised that the dogs selected were actually from three distinctly different pedigrees, a disturbing fact given the rivalry and famous fights to the death undertaken by these animals. (Yelverton 2000)

Armitage (1905) notes

> *One of the peculiarities of the Siberian sledge dog is that on the return of those that have been away, they are treated as strangers by the dogs that have remained at home, so that battles and murders result unless precautions are taken. All the dogs were therefore chained until they became accustomed to one another once more.*

This strategy seems to be one of the few pieces of previous polar experience applied to the work of the *Discovery* expedition.

Skelton provides further insight into dog sledging practice where he inserts descriptions from his sledging journal into the main record for Tuesday March 4th. (Skelton 2004) He illustrates the arrangements of traces for the first serious attempt at sledging. This was a journey from Hut Point to Cape Crozier via the Great Barrier to update the message (latest records and orders) for the relief ship in the "mailbox". This would instruct the relief ship on the location of Discovery. This journey was to have travelled across Hut Point Peninsular at Crater Hill, then across Windless Bight, named later during the well-known "Worst Journey in the World" of Cherry-Garrard, Wilson and Bowers in 1911. (Cherry-Garrard 1922)

On this occasion two teams were hauling four sledges. Diagrams show the arrangements for Royds' and Barne's sledge teams. Interestingly the arrangements showed an inexplicable combination of men and dogs at the traces, men leading and outnumbering dogs. Skelton goes on to report that:

> *the dogs work fairly well*

but then the following day referring to the men's effort:

> *it was absolute bullock's work.*

The Captain was to have gone but he had sprained his knee on February 28th. Armitage (1905) reflects on dog handling:

> *From my experience in the North, I did not care for the idea of men and dogs dragging together, which had been arranged. When they are harnessed to the same sledge, they seldom pull together.*

We now realise that the dogs used on the main southern journey by Scott, Wilson and Shackleton were severely overloaded (i.e. there were insufficient dogs) and that they were disinclined to work in any event when working together with men in the traces. Ultimately they succumbed to the harsh treatment and food (dried fish) that had perished in the tropics. They might have learned from Borchgrevink's example regarding diet and dog handling but he was probably not consulted on the matter.

Baughman (Baughman 1999) summarises key features of the early dog handling attempts:

> *The dogs pulled on this occasion (Easter day trip), and Scott stated his conviction that they would be "of the greatest use to us on our trip." In other respects, Scott was still puzzled by the sledge dogs, animals he did not understand well. Their behaviour he often anthropomorphized, which led to disappointment with the creatures. When the Cape Crozier party returned, the dogs at the ship had been allowed largely to run freely around the area. With the return of the dogs from the Crozier trip, problems developed. The newly returned dogs were not accepted back into the pack, and two of them were suddenly killed. The dogs' pattern of singling out and killing bothered and puzzled Scott and the other men in his party. Only Bernacchi and Armitage had experience with such animals.*

The dog race demonstrates that there were areas of very basic knowledge where the expedition members were completely ignorant. Scott had spent considerable time with Nansen and it is reasonable to expect that the art of managing dog teams to good effect would have been a central topic of discussion.

Skelton did not even mention the great dog harness race even though it seems the whole crew turned out for the competition. His diary for these days focuses on the first medical emergency when Ford broke his leg downhill skiing on the far side of the Gap towards Pram Point. It was also on the 19th of February that Shackleton, Wilson and Ferrar set off on a sledge journey to investigate White Island.

It is not possible to determine whether this competitiveness was spurred on by elements of navy vs. civilian, scientist vs. layman or the healthy egos of Bernacchi and Armitage, both with prior polar experience? Was it just a bit of sport?

Possibly it was a genuine attempt to test methods and establish the most effective strategy. With one exception there is no record to indicate whether the outcome of the competition informed future sledging practice. Duncan notes in his diary for October 24th:

> *Hands busy with stores for depot party also Dog Harness, the Harness that was brought from London is no use. So nev (i.e. new) had to be made…*

Notably, this is the one instance where the experimentation of methods led to some developmental innovation. The great dog race (presumable when it was decided the harnesses were deficient) had taken place in February. Huntford (Huntford 1979) relates that Scott designed new dog harnesses during the winter (instead of learning how to use correctly the Siberian ones) and that this was the sole attempt to improve his equipment.

> *When he tried the harness on the dogs, it was a ludicrous fiasco and the original outfit was put on again.*

There are numerous references alluding to the need to whip or beat the dogs to get them to work on the main journeys. A skilled sledge driver cracks the whip above the dog that's not working, without actually beating it.

Savitt (Savitt 2004) thoroughly reviews the evolution of knowledge of sledging practice by polar expeditions. He supports my conclusions:

> *Robert Falcon Scott, in great part as a result of his naval heritage, did not fully understand the need for and the methods required to gain the operational knowledge required for sledging in Antarctica.*

4.3 "…a blasphemous frame of mind"

The *Discovery* was a ship built on traditional lines, but incorporating modern equipment. There was electricity available by courtesy of a dynamo that ran off the main steam engine. An innovation for over-wintering was the windmill, intended to replace the steam driven dynamo once the main engineering had been shut down for the winter. This was to have delivered about 3 horse power in a fifteen knot breeze and would have provided light to some areas of the ship. It was a favoured project of Scott's as he was worried about excessive fuel use. Having the mill provide power for lighting through the long darkness of winter would have meant significant fuel savings. Another element may have been national rivalry. Windmills were also used on von Drygalski's *Gauss* and Nansen's *Fram* expedition ships, so it may have been a marker of pride that *Discovery* also employed the latest technology.

Duncan observed on April 12th

> *Strong morning its blowing very hard & the Wind Mill is going very fast. We expect it to come down by the sun.*

Then the following day:

> *our Wind Mill has come to grief by the strong wind. The frame work & sail getting bent & twisted. Hands are sending it down.*

Bernacchi (1902) notes first on April 13th that:

> *In the evening a heavy squall demolished the windmill on the fo'cle head for generating electricity. The sails were torn off & blown away some distance out on the ice. When in London this windmill was erected for a trial & on seeing it then I thought it of too flimsy construction to withstand the furious gales of the Antarctic Much time and labour has been expended in putting it up down here but it has never worked satisfactorily for electric light has been very spasmodic for some days. The Captain was much irritated over the accident & contended it was due to a "stay" being carelessly allowed to remain too close to the sails & therefore being caught against it.*

And the next day:

> *…a piece of our wonderful mechanical device for generating electricity was found out on the floe a considerable distance from the ship.*

Hodgson (Hodgson 1901-1904) stated more acutely:

> *Skipper in a blasphemous frame of mind but Skelton is joyful.*

Royds arrived up on deck in time to watch the mill self-destructing. The first damage was a fan fouling the ship's forestay then, bent out of shape, commencing to progressively smash itself against the main body of the mill. He doubted that it could be repaired.

Skelton's (Skelton 2004) account bears repeating as it tells us much about the interplay between characters:

> *Dellbridge went up to look at it & reported to me that, as far as he could see, the shaft and the hub of the fan were alright but the blades a complete wreck. He also found the Captain raging around in a panic, going for everybody about it, & he told Dellbridge himself that he ought to have seen to it. Most unfair I call it, as I am responsible for it & if he wants to find fault he can go for me about it, not for men under me. However, when I went up for dinner someone made a remark about the windmill & I said it looked pretty bad now, whereupon the Captain said. "well I hope you will do your best to mend it, sheer carelessness I call it." I at once replied that I did not consider it so in any way at all. Then he replied, "well we won't speak about it now", & shut up. No doubt he is annoyed that the scheme, which has been rather a pet of his, should have turned out a failure & spoke in 'pique', but it was very silly of him. Perhaps he will cool down. If not I shall be quite prepared for a row. I am heartily sick of the whole thing……an extravagant expense for an Expedition that is supposed to be hard up.*

Dellbridge spent considerable time overhauling the mill only to have it succumb finally to strong winds in early May. As Bernacchi wrote:

…The wind-mill for driving the dynamo which has been repaired and re-erected was completely demolished at about 7 p.m. It broke short off at the head & went over the starboard bow. So suppose this will be the last of that expensive and useless toy.

Duncan briefly describes the final demise of the mill:

The windmill is a complete failure-carried away. Two much sail area for the strong winds.

Royds merely reported that the mill had carried away, as if it were a matter of course. Skelton (2004) comments about the affect of the mill on the expedition's work:

Well it is all finished now, after we have spent endless time & labour on it, & all for nothing. It is certain more than ever now that such things are no good to play about with in these climates. Everybody who has worked on it has frozen fingers, ears, faces etc. At any rate I believe it has smashed itself up decently this time, at least I hope so, though it is disappointing to have had all our hard work for nothing.

The windmill incident provides insight on Scott's management and what appears to be a predisposition to fits of pique. The mill was clearly a pet project. It brought Scott and Skelton into direct conflict. Skelton knew early that the mill was not up to the job and expressed that opinion. When it collapsed the first time Skelton was pleased that the engineers could move on to more significant work, of which there was plenty. It transpired that Scott instructed that the mill be repaired, at the expense of a great deal of time on behalf of Dellbridge, second engineer. It all came to nought. Scott showed his stubborn streak and had blamed the engineers for at least, the first failure of the mill. In spite of Skelton being the senior officer of the engineering section, Scott spoke directly to Dellbridge contrary to normal protocol.

4.4 "…far from a picnic"

Descriptions of the first sledge journeys have been reported in detail in commonly available narratives, (Scott 1905., Armitage 1905) diaries (Savours 1966) and analyses (Baughman 1999) (Yelverton 2000) so I will briefly give my analysis with some key citations to support my claim that they were poorly organised experiences with nominal learning by trial and error.

The first sledge journey was from the edge of the Great Barrier when Discovery was returning from it's easternmost limit at King Edward VII Land. The ship was moored to the edge of the Barrier in an area where the edge was about the height of the taffrail. This was convenient for manhandling the hydrogen cylinders for the balloon Eva. The locality was christened Balloon Bight (78° 28' 52" S, 196° 15' E). A short first sledge journey across the barrier to the south was undertaken by Armitage, Bernacchi and four others. They achieved a new furthest south after a return journey of about 34 miles, arriving at 79° 03'S. It was notable for its simple errors. They were a party of

six, yet they had a three man polar tent. Bernacchi ended up sleeping outside the tent as he couldn't countenance the crush or the snoring of his tentmates. They were very fortunate the weather was equable. They set off confident they could operate the equipment. Skelton writes for that day:

> *The sledge party were not able to cook their food, both Bernacchi and Armitage appearing to be ignorant of how to use the primus lamp. Rather silly of them, I think, to go away ignorant. Armitage is, however, rather inclined to be one who will not take information on points useful in sledging from anyone else.*

Bernacchi reports the journey thus:

> *(Camp) took nearly two hours to prepare on account of our not properly understanding the primus stove we were using for melting the snow. Nor were our sleeping arrangements successful. Small tent packed to suffocation point.*

He refers to his sledge mates as "adipose gentlemen" and records he slept outside in wolfskins in spite of 32° of frost (i.e. 0° F).

Like the windmill, the balloon seems to have been a folly. Bernacchi states:

> *However, the excessive cost, & the danger of carrying the highly compressed gas, & the manipulation of the ascension by amateurs is not worth the small results obtained.*

Scott was the first to ascend but he showed he had little control, and maybe panicked, as he just dumped ballast wholesale when the balloon started to descend. Shackleton also made an ascent and took some photographs that revealed very little as the Barrier is featureless at that point and there are no ranges to be seen.

Armitage wrote of one of the first sledge journeys that ended with the travellers returning to the ship early:

> *The short trip was not quite useless, as it had shown those who were totally inexperienced in sledging work something of the realities of it.*

He also makes reference to the learning:

> *The objects of the journey were to train the men, and to lay out a depot in preparation for a future journey.*

The sledge journey to update the mailbox at Cape Crozier was unsuccessful and ended in disaster. Royds was in command and realising the objective was too ambitious for the supplies on hand, split the party up, sending most back to the ship. The story of the loss of Vince is well known, but it is not generally reported that it was a failure of correct gear that led to his death. In hindsight the party should have stayed in their tent when blizzard conditions

came on, but trying to make a dash to the ship, Vince was wearing finnesko (loose fur boots) that were very slippery, when boots and preferably crampons were required. Vince was unable to prevent a slide downslope and off the precipice into the sea.

Other gear failures included one primus failing with no spares obliging all cooking for 12 men to be done on one stove. Frequent frostbite indicated inadequacy in protective clothing, one tent ripped and required stitching and some of the instruments got broken due to inappropriate packing, or carelessness. If the sleeping bags were allowed to come in contact with the tent fabric during the night, the cold was transferred through to the occupant. On this trip they discovered the dogs' cunning skill of keeping the sledge traces taught without actually pulling. The usefulness of the dogs seemed to have waxed and waned according to the diarist and conditions. In any event it became clear that the workload was too heavy for both men and dogs in the extreme cold conditions with much deep, powder snow.

Royds gives an extensive account of the difficulties of camping and feeding yourself, managing polar clothing and difficulties of transport in his sledge diary from the Crozier trip (March 12th. 1902). He concluded:

> *These and many others which I will think about and write afterwards, all help to make sledging far from a picnic.*

Later in the year it was necessary again to embark for Cape Crozier as it was imperative to update the information in the mail box there for the information of the relief ship.

Hodgson write in his October summary

> *There has been a row over the way the sledging parties have managed & Royds, Barne and Ferrar have made a warm time with the Captain.*

It didn't go well either and Skelton writes candidly (October 27th.) about Royds' performance:

> *Skipper called me into his cabin & asked me plainly what our Terror sledge party had done and why we were back so early….of course, as he pt it in a confidential way, I gave him a few details; how we had existed in the 5 days blizzard; Royds' poor spirit under the circumstances; the discomforts he causes others in a tent by his awkwardness & 'girlishness';.....I also said I didn't consider Royds was cut out for sledging, that he was the wrong man for it...I certainly did not give Royds away half so much as I might, particularly leaving out the incident of his sprained ankle, the most discreditable incident to my mind....There is no doubt that, though he does not actually funk sledging, he is next door to it & in fact is never feeling happy, too girlish, & he certainly has very little brain & no observing powers at all for scientific or interesting matter.*

It is remarkable that Scott was able to take Wilson and Shackleton past 82° South on the main southern journey leaving on November 2nd. When one considers the slow learning regarding sledging practice and the insufficiency of dogs to assist with hauling. Determination and hard work certainly did allow the party to overcome difficulties that would have defeated most explorers.

The use of language provides us with clues that sledging was seen as a voyage but across frozen water. Starting off was "getting under weigh", the sled had a "Bow", they "capsized" and wherever possible the sledgers "set sail." Navigation techniques were the same as at sea with the exception that an artificial mercury-bath horizon was required for sextant shots as the horizon was usually obscure.

4.5 "Usual retine Work diggin out Boats"

In early April preparations were underway for winter. One preparatory task was to install a large canvas awning over the deck to help protect from wind and cold. The ship's boats prevented the correct fit of the awning so Scott decided to place them on the floe behind the ship.

Bernacchi had his advice disregarded on the issue of placing the ships boats on the ice floe. He writes in "Saga of the Discovery" (Bernacchi 1938)

> *It was then that I had my one and openly experience with what seemed an unreasonable side of his nature. I had been through a winter before, and had seen the effect of the unbelievable weight of snow which accumulated upon the ice, pressing down into the sea so that the water displaced flowed over it, making a top layer of slush, until that, too froze. When I saw Discovery's boats spread out upon the ice, I had indicated the possible danger. The result was an experience I did not care to repeat, for I was told, in no uncertain terms to attend to my own speciality.*

Bernacchi notes in his journal (Bernacchi 1902) for mid July:

> *…the ship's boats out on the ice were lost under the drifting snow & it took some hours to find the place under which they lay buried. The tops of the boats were more than 3ft. below the surface.*

Duncan (Duncan 1901-1902) in his July 23rd. entry provides more detail:

> *All hand are out at the boats trying to get them out. The keels are 6ft. below the land of snow & full of water in fact they are very nearly through it altogether. The weight has caused the flow to sink & the water has overflown A pair of shears with purchase is rigged up over case & all hands were pulling but could not move one end of her A Big Job.*

Over the next few days' entries Duncan expresses the opinion that the boats are frozen solid and there is no headway with the task in spite of having eight men at the work.

> *All hands at the boats-no headway & all frozen solid.*

Over winter the boats were covered in snow that turned to ice, locking the boats into metres thick ice blocks that occupied (wasted) hundreds of man-hours digging them out. The diaries record that digging out the boats was a daily activity, all day, from late June onwards for teams of usually eight men. The first boat was extracted on November 9th. and required considerable carpentry to make is seaworthy. The last boat was extracted the following January, after more than six month's work sawing through ice over fourteen feet thick.

Wilson provides an insight that reflects back to the influence of Markham. The obsolete thinking from Arctic polar expeditions might not effectively inform Antarctic expeditions. He notes in his diary for July 22nd. (Savours 1966)

> *All the ship's boats were put out on the floe, as I understand has been done by every ship in the North without mishap…I think however that the critical ideas which must be met when we get home, having lost <u>all</u> our ships boats in such a soft way, will be sufficient stimulus to pull them out somehow.*

The episode of the ship's boats may have ended in an awful situation where all boats became lost through the ice. These were not only the life-boats for the ship, but absolutely necessary for the working of the ship, and transport to shore when the ship was released from the ice floe. This represents a significant error of judgement and neglect in not considering the experience of well meaning informant.

4.6 Equipment

In a masterly piece of understatement Armitage states:

> *During the later half of the year the men were kept constantly employed in preparing gear for the sledge journeys.*

This included provision bags, canvas tanks, sleeping bags, ice axes, shovels, instrument boxes, snow-shoes, protective clothing and even sleeping bags. It is alarming that the men had idle afternoons throughout winter, and then were pressed constantly as the sledging season approached to work long hours to finish the equipment.

Much of the work being done could have been done prior to the voyage or commenced much earlier allowing time to test and improve. Sleeping-bags are a prime example. Sleeping-bags were sewn together from reindeer furs by the men. Bernacchi (1938) hints at the inadequacy of the sleeping bags when he describes sledging as:

> *One day was like another day, except for changing light and surface conditions, a period of hungry straining misery to be followed by a night of hungry shivering misery, until with the thawing out and gradual warming of sleeping bags from the body's heat, troubled sleep came…*

The sleeping bags accrued moisture that froze. Bags that started a sledge journey weighing 29lbs. came back weighing in at 70lbs. due to the extra ice and moisture trapped within. This was partly perspiration and condensation in the bag and partly that the bags went unprotected on the sledges, so filled with snow during travelling.

Bernacchi (March 25th 1902) describes work being carried out in relation to equipment:

> *All manner of arrangements & new devices being made, one being a new and convenient snow shoe, made of thin sheets of wood, oval shaped and about 2ft. by 1ft. in size.*

Why was this necessary when there were 30 pairs of Canadian snow-shoes ordered and sent on via Melbourne with the dogs and other equipment, that was known to have arrived? Duncan reports that he is making 28 pairs. Jobs like attaching handles to ice axes and snow shovels could have been started earlier in the season.

Royds (August 20th.) notes that Skelton (Chief Engineer) was even pressed into working on face protection.

4.8 Reflections on management

Why did Scott disregard the good advice of skilled or knowledgeable crew-members? Why did he not see that some of these follies would result in hundreds of wasted hours for his crew?

It may have been that Scott found control of the human element of the expedition easier than control of the canine element. Scott was probably used to working in a system where there were always extra hands on-call when there was extra work to be done. In this closed, polar society such was not the case when the spring sledge season was approaching, and the realisation dawned that there was a great deal to be done.

The established hierarchy of the Royal Navy meant that discipline was maintained amongst the majority of crew. Maintaining control of the scientists, merchant seamen and naval reservists was probably more of a conundrum to Scott. Compliance from this element of the staff was not automatic. It relied on respect built by achievement and effectiveness. I believe there some members of the expedition (both naval and civilian) that did not respect Scott. Huntford's (Huntford 1979) comments support this statement.

It is revealing that Scott needed the rigid naval hierarchy to assert his authority.

One diary entry by Duncan (Duncan 1901-1902) entry relates how on a Sunday morning at the end of winter the ship's company were kept waiting on deck for the routine inspection. It seems that Scott either slept in (as happened on Sunday June 2nd.) or forgot what day it was. It is a measure of the men's sense of duty that they waited on deck in sub zero temperatures. This incident (August 3rd.) informs our understanding of the sense of duty that the Royal Navy fiction achieved for the bluejackets.

We are all on the upper deck 9 a.m waiting about until 10. 45 & its very cold. The Captain being last in giving the sounds. All hands are swearing at being kept in the Cold for 2 hours & its blowing a gale. (Temp –23 °) We are treated just As if we were children.

Almost the same thing occurred a month later on October 5th, although Duncan does not record the duration of the wait. This treatment of the lower deck would certainly have undermined respect by them for the officers.

This event is in contrast to Scott's treatment of one of the crew on the last Sunday of June where: (Duncan 1901-1902)

One of the hands before the Captain for Smoking during church He said it was Damned Imputant & is to consider his case.

There were two other disturbing incidents during the run from the Cape to Lyttelton. On October 17th. Duncan relates that:

A big sailing ship crossed our bows & to save collision we had to reverse engines & astern

Then on November 20th. he notes:

Made sail & stowed it twice today, & now 1170 miles from Lyttelton.

Both these incidents would have undermined the confidence of crew in the ability of the Captain. The former especially represents an incident that is unthinkable in terms of square rig ship handling. At least Scott could have anticipated the situation and hove to in plenty of time to let the danger pass. The second incident represents indecision and possibly poor seamanship. It certainly would have made a very physical day for the topmen, probably to no effect.

The deficiency of any analytical approach to problems is also obvious in the matter of scurvy. Captain James Cook had received the Copley Medal for the paper he presented to the Royal Society that described the successful management of scurvy on naval expeditions about a century before the

Scott's *Discovery* sailed.[4] An essential error that brought scurvy back into the range of problems for mariners, was the idea that if lime juice was good as an antiscorbutic, then boiled and concentrated lime juice would be more potent. It is now common knowledge that boiling destroys the vitamin C rendering concentrated lime juice ineffective. Scott and Keottlitz were operating under the belief that scurvy was actually caused by ptomaine poisoning (i.e. salmonella) from tinned meats. This does not make strict sense as scurvy was a problem for mariners hundreds of years before canning started to replace salted meats during the Napoleonic era around 1810.

Wilson, on viewing the ice crack near Pram Point (Savours 1966) in February was greatly relieved to see:

> *…a perfect multitude of Weddell's seals, literally thousands…a wholesome sight to us, because it practically outs scurvy out of the question.*

He knew the value of fresh meat as a preventative for the malady. Consumption of seal meat was only commenced seriously when scurvy had been detected in Heald, upon return from a spring sledging journey. Shackleton and Wilson's "break down" on the main southern journey may have been delayed if consumption of seal meat as a preventative to scurvy had commenced for all crew earlier. It is interesting to note that Heald (Heald 1901) does not mention the diagnosis in his own diary, as if it is a reflection on his habits or level of care.

The *Discovery,* amongst its list of medical comforts included 156 gallons of limejuice! It seems that limejuice only made it to the dinner table on September 29th after scurvy was detected amongst the crew. Seal meat became a daily element of the fare at the same time. Duncan notes on October 12th, when the last of the New Zealand Mutton is being consumed, that they are sick of (now twice daily) seal.

Royds and Wilson's diaries both frequently mention headaches. These were most likely the result of dehydration. There does not seem to have been any attempt to determine the origin, or a cure for this common and debilitating malady.

Discussion and Conclusions

The theme of ill-informed but well-meaning explorers was developed in this section. Nansen demonstrated his analytical skill by determining that the drift of the Jeannette in the Arctic ice took the ship across the top of the world. During the period analysed in this study (1900 to early 1903) Scott does not demonstrate any acute analytical skill. There are errors of judgement and lack

[4] Ironically Cook's ship at the time of his death on the shores of Hawaii was one of the earlier ships named *Discovery* that made the name famous amongst exploration ships.

of any reflective practice in relation to sledging practice, the ship's boats on the ice, the windmill and general preparation and organization of equipment.

This is not a personal reflection on Scott. I believe he did well under the circumstances. He was ill equipped by his naval training and management style for the breadth of responsibility of the expedition. Youth and inexperience cannot always succeed where maturity, planning and a scientific approach might.

5 : "Walking to Christchurch"

This section discusses the cycles and routines of life, that developed, or were imposed, to cope with life at Winter Quarters. On April 22nd 1902 Hodgson's fish trap hole number "3" was renamed "Christchurch". "Walking to Christchurch" was a common winter diversion that allowed escape from the ship.

This element focuses on the various work routines, recreations and pastimes undertaken, especially through the long winter darkness. Some of the entertainments seemed to have been deliberate busy work to keep men occupied and prevent the winter maladies of depression and boredom. If that was the intention, then it must be considered successful. I suggest that there was an excess of diversions, and the freedom to indulge in them. The preparation for geographic work of the expedition suffered as a consequence.

I argue that there was a great deal of preparatory work to be done for the spring sledging, and opportunities to make productive use of the mid-winter hours were squandered.

This was no normal polar expedition. In comparison to many it was a physically comfortable experience. The ship had not been sent back to New Zealand, but retained as the central feature of the polar base that became known as "Winter Quarters".

On one level, this was effective use of the resource that was the *Discovery*, a floating laboratory and ready-built accommodation unit. The living hut from Melbourne was essentially a pre-fabricated Australian squatters hut and voted unsuitable for polar work as it was impossible to keep heated to any level of comfort.

I maintain that another reason to allow the ship to be frozen in was that the wardroom, having been established as an exclusive version of a gentlemen's club, gave great comfort to the officers and scientists.

During the long Antarctic winter night the lives of the Naval and civilian (scientific) staff were governed by routines and cycles. In spite of the absence of daily cycles for much of the year (otherwise marked by sunrise and sunset but lost during perpetual daylight or perpetual darkness), it was still a life with rhythms. Maintaining a cyclic set of activities and providing some organised

activities and festivities assisted maintaining order, peace and harmony amongst the crew.

5.1 Naval routines

Of course all the naval staff came to the expedition with a life governed by routines. At sea life was dominated by cyclic watch keeping, ship handling, and maintenance and repair responsibilities. This changed when the ship was frozen into Winter Quarters and became the expedition headquarters, floating laboratory and clubhouse.
As winter set in, and the sea froze the issue of the perpetual leaking into the bilges of Discovery became less significant. Bilge pumping became a weekly task but was probably more onerous as there was no steam during winter to drive pumps, so it became a manual task.

Sunday Divine service and inspection was a routine of shipboard life, as was Saturday afternoon "make and mend" where the bluejackets had free time for recreation. These two aspects of maritime routine were continued during the expedition. Most other routines were subverted by the need to adapt to the alien polar environment.

The daily routine of the navigator (dawn sightings, dead reckoning of position, midday sunshots for zenith and therefore latitude, then afternoon fixes) were replaced by scientific observing routines.

5.2 Polar cycles

Food was a central marker of time for residents of Winter Quarters. At sea the meal routines were breakfast, 8 a.m., Lunch at 1 p.m., Tea at 4 p.m. then Dinner at 7.p.m. As the polar winter approached the routine was changed to delete one meal and thus breakfast at 9 a.m., tea at 2 p.m., then Dinner at 6 p.m. became the norm.

Duncan describes a winter's day April 22nd. thus:

> *Just a few lines about how we are getting along All hands are called at 6.30 start work 9 am. The men getting ice from ice foot and filing Tank over the stove. For demostick use 8 a.m. Breakfast until 9. turn two until 1 p.m then Dinner which finishes us for the day. This is the Winter Retine.*

Thanks to the generous gifts from New Zealand farmers there was ample mutton to provide for Sunday meals for most of the year until the relief ship arrived in early 1903. Sundays were therefore a highlight. Petty Officer Duncan notes in his diary the joy of cooking, for breakfast a mutton chop left over from the previous night's dinner and on June 1st.

> *Dinner at 7 P.M Consisting of New Zealand Mutton which the farmers were so kind to give the ship. Sunday is very much looked forward to.*

By all accounts Bernacchi was also fond of his food. Later he was to become the subject of caricature known as “Lodestone” depicted with a capacious girth. This is probably more related to his height, than weight as Louis was the shortest in the wardroom until Sub-Lieut. Mulock arrived from the *Morning* as a replacement for Shackleton.

Armitage notes one occasion in autumn, before the ship was frozen in Bernacchi had been ashore overnight taking magnetic observations. The crew were re-mooring the ship during the morning so no-one was available to row to shore to pick him up.

> *…and just managed to get him on board in time for lunch, which Bernacchi enjoyed even more than he ordinarily did; for he had gone without breakfast, notwithstanding the fact that as Shackleton pointed out, there was a stove in the hut, plenty of coal, and provisions sufficient to ration one man for thirty years.*

Physical measurements were determined for all the men (i.e. the lower deck) and wardroom (officers and idlers) by the doctors on a monthly basis. Their strength was measured and blood samples were also taken to determine their cell counts.

> *Bathing was occasional but locked into cyclic patterns. Everyone had cold baths until early May. After that, officers and men enjoyed the luxury of a hot bath weekly, the men using the officers’ rubber portable baths on Fridays. (Yelverton 2000)*

The polar seasons and day length cycles are contrary to the experience of most people. At the south pole on the summer solstice the sun circles overhead at its maximum altitude of 23° (the same as the angle of the earth’s tilt) but is visible throughout the 24 hours of the clock. Similarly, in mid winter there is perpetual darkness within the Antarctic circle for at least some of the time. The Antarctic circle describes the northern limit of either perpetual daylight or perpetual darkness. This plays havoc with the internal clocks of people accustomed to mid latitude life, as were most of the crew of *Discovery*.

Duncan notes on January 1st. 1902:

> *63° 6 South, 173° 47 E. We now have daylight all the 24 hours.*

The start of the Antarctic winter is nominated to be when the sun sets, or is no longer visible at midday. At Hut Point (Latitude 77° 51’ S) the sun dips on April 22nd. Duncan writes:

> *Climbed the hill & took a look at the Sun for the last time this season as it disappears tomorrow for 103 days.*

It was actually 123 days to the end of winter.

The return of the midday sun is recorded by Bernacchi on August 19th. Thus

> *The colouring of the Northern sky & on the western mountains from the sun now only just below the horizon at noon is superb. Mt Discovery to within a short distance of its base was transformed into a deep red (unintelligible) the small dark islands around the bay partook of a purple tint. Took some spectrum photos with the prismatic camera in order to get atmospheric spectrum while this deep red hue prevails.*

The winter awning that had been spread across the entire deck of the ship (the reason for placing the ship's boats on the ice for winter) was removed. It had been there since April 7th. Duncan notes for September 17th.

> *The winter awning that was spread all winter was furled today. 10 of the men had fingers & noses frostbitten it being so cold (Temp) -32°*

This was a sanguine move considering temperatures remained low (minimums in the -30°F range) through most of October. The arrival of spring required a shift from more sedentary work back to the central enterprise of the sledging programme.

5.3 "Shackles, try this one…."

It was the habit of the night duty officer (officers or scientific staff) to experiment with culinary creations, usually based on toasted sardines and cheeses. This was the prerogative of the nightwatchmen who, every 11 days had to stay up through the night taking the meteorological and auroral observations. They would create a new sardine dish, then wake up their shipmates to provide tastings in the early hours of the morning.

Armitage (1905) writes:

> *The men took it in turns to be on watch during the night, too, to keep the fires trimmed, and to call the observer, if necessary, at the requisite time. Most of us preferred to pass the time by reading or working, and by preparing savoury dishes of toasted cheese or fried sardines over a spirit lamp.*

Royds record in his diary for July 15th.

> *Had my cup of cocoa and two sardines at 2.0 and then went into my cabin and wrote, and on coming out for more fodder at 3.30, I found the blessed cat had eaten the whole plate full of sardines…*

Other routines for the wardroom (officers and scientists) included all the cycles of scientific observation (e.g. ongoing magnetic observations with "term" days each fortnight, weather observations each two hours).

Wilson and Shackleton established a thermometer at the summit of Crater Hill and Armitage reports that they made a daily climb (a steep 300 metre scramble) to record the temperature, for comparison with the sea level records.

5.4 Polar ennui

We are in a mad house, and our humour points that way

The words of Frederick Cook, surgeon of the "Belgica" expedition (1897-1899) as they were trapped in the Antarctic pack paints a grim picture. (Cook 1980) These were the first men to overwinter in Antarctica, but they were ship-bound, in contrast to the terrestrial *Southern Cross* party of 1898-1900. The crew of the *Belgica* certainly suffered from mental disorder including persecution mania. Probably in response to reports of this expedition, and unfavourable reports about the relationships on the *Southern Cross* expedition, the *Discovery* was thoroughly equipped with activities to save men from boredom in the polar night.

On January 30th. Bernacchi had written in a positive manner regarding relations between crew of the Discovery:

> *Good luck has been with us ever since leaving New Zealand. If this continues. The enthusiasm, splendid concord & fellowship prevailing on board will do the rest in making this 6th Discovery Expedition a huge success."*

Duncan makes a comment regarding the approaching winter on April 22nd.

> *…A very desiloute look around never the less we are quite happy.*

The Discovery officers and doctors were aware of the dangers to emotional and mental health from long polar nights. Bernacchi notes on mid winter:

> *…there is absolutely no indication on any face of depression due to the "Long Antarctic Night", "The White Silence" or the "Struggle for existence" etc. we have all heard so much about. Not the slightest sign of ennui is visible & all are clean & healthy looking; indeed the majority of officers & men still shave.*

A great fear was that cabin fever might lead to conflict. There were a few minor cases but nothing of real note. Bernacchi reported one incident on June 17th:

> *…one of the sailors eccentric behaviour…suddenly gone wrong in the attic…*
> *He threatened to "break the heads" with other embellishments, of some of his messmates on the lower deck….he got up on awning-induced to come down & put to bed by Dr. K…a sleeping draught being*

administered…it's possible that he managed to get at some intoxicating liquor.

The crew of the *Discovery* certainly did not suffer any the deep emotional or mental maladies of earlier arctic or contemporary Antarctic expeditions.

5.5 "I Go on Rats"

The intellectual entertainments included cards, chess, (draughts on the mess deck), lectures, debates, reading from the extensive library aboard, production of the South Polar Times, theatrical productions and music. For some, photography was an entertainment. It seems that the Discovery was supplied with two pianolas and one piano, but only one person (Royds) capable of playing these instruments with any skill. Weller on the lower deck had a mandolin, but there are no comments regarding the level of his artistic skill.

Duncan notes the first issue of the *South Polar Times* was distributed on April 22nd. This publication was produced entirely on the ship under the editorship (in 1902) of Shackleton, who typed up the copy late at night in his cabin. Wilson illustrated it and contributions were gleaned from crew with any writing talent.

Wilson (Savours 1966) writes in mid May:

And then the whole of the rest of the day spent drawing for the S.P.T., a job which takes up a lot of time, but we are bent on having a good paper to show for our winter down here. And it certainly is a considerable factor in giving occupation and amusement to every one on board, so I cannot think it is a waste of the time spent….in fact the paper brings out the human side of the members of the expedition and leaves the Narrative and the Scientific Reports to do the rest.

The South Polar Times was billed as having the largest circulation of any periodical within the Antarctic circle.

Life in the wardroom seemed mostly convivial. Royds notes what may have been a typical event (January 8th, 1902)

We had champagne for dinner, and we have two bets to work off, one between the Captain and Bernacchi that we should be out of the pack by tonight, which the Captain lost, and one that we should be in the pack 20 days, which Bernacchi lost.

The list of medical comforts for the Discovery was extensive and included Brandy (27 gallons), whiskey (27 gallons), Port wine (60 gallons), Sherry (36 gallons) and 1000lbs each of cabin tea and coffee. For the lower deck there was plug tobacco, rum (800 gallons) and 1800 lbs each of "crew" tea and coffee.

Parlour games in the wardroom included billiards, chess, poker, whist, bridge and euchre. Wilson (Savours 1966) described the excess:

> *Every single day cards begin after dinner and go until midnight. Poker had a long reign, whist followed, now bridge. Chess had an innings, also dominoes.*

Bernacchi and Koettlitz had a chess tournament during July, the bet being a champagne dinner in Christchurch. Koettlitz won but we don't know if he ever collected the prize.

On February 17th Bernacchi tried his hand, with Koettlitz, at colour photography. He was an experienced photographer having taken all the images for the Southern Cross expedition, and as physicist, processing photographic traces from instruments were a daily part of his life. The colour photography of the time was a complex affair, required three exposures (using the Sheppard apparatus) of different length for each colour filters red, green and blue. Bernacchi's attempt was not successful, but Keottlitz got results later in the year. Colour photography was in its infancy and an uncertain art [indeed all photography in the Antarctic was a challenge] so Bill Wilson's paintings provided a valuable record of scenes and specimens in colour.

Skelton was the official photographer for the expedition but many others tried their hand at is as a recreation, and I imagine to have a tangible memento of the Antarctic. Similarly, penguin taxidermy was most likely undertaken as a pastime. At one stage 33 Emperors were sacrificed and placed in an icy mass grave for later attention. It's unclear whether this apparent excess was necessary.

The expedition library was very well stocked (with the exception of a couple of useful narratives that might have informed sledging practice, Nansen's Farthest North for example). There is a 33 page printed catalogue listing all books ranging through the topics of biography, essays & philosophical, historical, fiction, travel (including polar classics), poetical, magazines, reference, scientific and expedition literature. (Cant Museum Collection MS 276, Item 42). Bernacchi was charged with the responsibility of distributing the library to wardroom members at the end of the expedition.

Poetry was enjoyed in the wardroom, and Shackleton in particular had a talent for lengthy recitation from memory.

Baughman notes (Baughman 1999) that:

> *In addition to the debates, one evening Bernacchi and Shackleton paired off in a contest to defend their favourite poets, Tennyson and Robert Browning, respectively.*

Armitage sets the scene:

> *Two members of our mess Shackleton and Bernacchi were very fond of poetry, and, of course, each had his favourite author. Many were the arguments raised as to the respective merits of Browning and Tennyson, so it was decided that Shackleton should read extracts from Browning and Bernacchi from Tennyson, while the remainder of us listened and carefully judged between the two, voting after each pair of extracts had been read. They declaimed in their best style, endeavouring to point out the beauty of the passages chosen by them. Ferrar caused much amusement, after an extract from "The Pied Piper of Hamelin" had been read by saying "Well I'm not much on poetry, but I go on rats." Browning won by a single vote.*

An anti swearing club was formed but it quickly went the same way as the windmill.

5.6 "A Polar Ulysses"

Bernacchi provides some insight to polar expedition life and separation from society in a letter to his brother Roderick from Winter Harbour (Palmer Collection) in February 1903:

> *Suffice it to say I am in the very best of health & have been absolutely contented & have done a good deal of scientific work which will take some years to work up. Nevertheless although there is not the slightest shadow of discord or discontentment on board, you cannot conceive how dreary this kind of life is & how very long it seems. I am tired of being a kind of Polar Ulysses & on my return, must find a Penelope & settle down in London.*

He later writes again to Roderick from the Falklands, in July 1904 on the return voyage that:

> *Port Stanley is the most deadly place I have ever visited…the people are all asleep….*

There is almost only one tangible connection between women and expeditions to Antarctica at the turn of the 19th. century. Whaling was a high latitude occupation that, amongst other things, supplied the raw materials for corsetry for ladies of fashion. It was also a source of clean burning oil for parlour lamps. Women had also played a part in equipping the expedition by sewing together segments of bullock gut to create the fabric of the hydrogen balloon "Eva" used on the first (February 4th, 1902) Antarctic flight. Otherwise, as Chipman (Chipman 1986) states:

> *No woman had a part in any of the wintering expeditions of this heroic era.*

The male dominated society of the high latitudes was certainly not welcoming to the other gender, and the atmosphere of the wardroom may have intensified opinion.

Letters (and care packages sent by the relief ship) were received from women. Royds was in the habit of keeping a bundle of unopened letters and taking pleasure in pacing himself through his stock of comforting missives from relatives and friends.

Armitage (1905) describes the May 2nd. debate on women's rights:

> *One of the most amusing debates was that on "Women's Rights", all of us with the exception of Hodgson, being agreed that the fair sex suffered from disabilities, in comparison with man, that should be remedied; and that they should have, when capable of maintaining them, equal rights with man.*

In contrast, Baughman (Baughman 1999) indicates that maybe the members of the wardroom were liberal in their thinking. He writes that the question under debate was specifically:

> *Do Women suffer any disabilities at the present day?*

He then adds

> *The vote was 10-1, with Hodgson, who had spoken against women's rights, voting in the negative.*

Bernacchi himself just states it was "extremely ludicrous." Royds didn't speak as he writes that he has

> *…no ideas on the subject.*

Skelton's diary (Skelton 2004) reports the event:

> *Some of the speeches were very amusing & the members for Ireland & the Colonies[5] had to be called to order several times, Armitage in the chair. The Skipper's remarks very good, though he only spoke of one class, the upper middle class. Hodgson also spoke very well against the Rights.*

This discussion about a woman's place and rights is further informed by the entry in Skelton's diary for November 8th. There is a discussion in the wardroom about whether married men should go on polar expeditions, and concludes that Bernacchi's views were a source of amusement.

[5] Shackleton and Bernacchi.

There is no doubt that men on polar expeditions miss intimate relations, and attitudes to women expressed during the *Discovery* debates were probably those entrenched in their stratum of society, rather than new ideas developed in response to polar isolation. It seems that there may have been some enlightened attitudes expressed amongst these well-educated men, but the accounts seem contradictory.

Even the good natured Edward Wilson was affected by close living as reported by Baughman (Baughman 1999)

> *Naturally, at times, the men wearied of one another. One day Wilson got "deadly sick of everyone" and went for a solitary walk to Crater Hill but returned in an "angelic temper". For Wilson, the long winter months exposed the difficulties of men living together alone, separated from the "better half of humanity". He noted that while some of the men seemed decent at the outset, the mask had come off and they were unpleasant now. Another time Wilson railed against the naval mentality and all who possessed it.*

During the *Belgica* expedition of Adrian de Gerlache (deGerlache 1998) there was a beauty contest.

> *So having run short on other kinds of entertainment, we organised a beauty contest at the end of May. A beauty contest in the midst of the pack ice, I hear you say? Yes, indeed. A real beauty contest, with two hundred competitors: actresses, dancers – all brought together in a photo album given to us by one of our friends in Antwerp. This little joke kept us occupied and amused for a whole week. There were several prizes to be won, with one special prize for the winner – and well, in any case, we needed time to make up our minds and choose among the contestants. A week of campaigning and electoral manoeuvring! Need I add that the deliberations of the jury on the last evening were extremely animated, and they were only finally concluded at a very late hour?*

Bloom (Bloom 1993) observes:

> *In the late eighteenth and early nineteenth centuries, polar exploration narratives played a prominent part in defining the social construction of masculinity and legitimised the exclusion of women from many public domains of discourse. As all-male activities, the explorations symbolically enacted the men's own battle to become men.*

This accords with the fact that the officers and crew were mostly very young men looking to achieve in their own manner, and to find some glory thus securing their futures. It also reinforces the idea that polar exploration (and the attendant recreations) probably further entrenched conservative attitudes. The advent of the "Nigger Minstrel Show" and other theatrical sports probably buttressed attitudes that are considered distasteful today.

Smuul (Smuul 1957) relates a more contemporary example of the selflessness of polar scientists and their dislocation from female society. He relates the “heroic deeds” of Scientist Ivanov at the Komsomolskaya Base in the deep Arctic. It was the habit of the three staff to watch a particular film “Forfeited Dreams” on consecutive evenings. It comprised one third of the base film library. In the film the central protagonist:

> *…the beautiful Anna Zaccheo, becomes a toy in the hands of fate, and a scoundrel.*

Ivanov’s selflessness is indicated by his willingness to forego the pleasures of watching Anna’s exquisite bare shoulders, to go outdoors at regular intervals to make scientific observations.

The “Alliance of Honour” was a puritanical association that was fervent in the belief that masturbation led to ill health and depraved sexual practices. The Alliance referred to it as “the Special sin.” Apparently Scott’s men were pure, and none engaged in the practice. (Manhire 2004)

The English Newspaper, The Chatham Observer reported an address by Bernacchi on July 17th, 1914 entitled “Polar Exploration-Its Moral Aspect” but I’m unable to report the opinions expressed on that occasion.

Debate generally alternated between scientific and topical issues. Other debate topics included:

- "Is the Great Ice Barrier aground or not?"
- "Is our commercial supremacy maintaining its lead or not, & are we taking the proper steps to maintain it?
- "Are the conditions going to be settled or unsettled during the winter here" Skelton notes this was a very amusing debate.
- "Conscription, would it be beneficial to the British Empire?" Royds in the chair. Skelton rated this a very good debate.
- "Ice Navigation" & "The chances of discoveries East & West of us."
- "The best method of sledge travelling in the Antarctic" Skelton “went strong on motor cars” and rated it a “good debate.” Hodgson however rated it “Not a very brilliant affair”

For May 27th. Skelton writes:

> *The weekly debate this evening was to have been a discussion on Seals & penguins but the Seals were considered enough In themselves, so we decided to leave the penguins for another time. I was in the chair. A most interesting debate.*

And for June 3rd.

> *In the evening we had our weekly debate on "Spiritualism" , more in a light than a serious vein, Wilson in the chair. Old Royds who is a superstitious as he can be…*

Skelton (Skelton 2004) seemed to be hot and cold on the value of debates. Towards mid winter he notes:

> *weekly debate on "Is the influence of sport beneficial to a nation or not?" Bernacchi in the chair. A very uninteresting debate altogether, & some awful rot talked….*

Hodgson concluded at the end of July that:

> *Debates are now dead, choked with ridicule and drawn to an idiotic length.*

Wilson (Savours 1966) comments on the regime of debates on July 8th:

> *In the evening we had a debate on sledge travelling. Of course everyone speaks and sometimes we have great fun. Bernacchi is nearly always amusing. Lays himself out to be absurd and succeeds. They are not bad sport and have been very successful on the whole, though I think that signs are not wanting that we have had enough. Everyone has so much to do and feels like winter is slipping away without getting to work intended done.*

The lecture program was really instituted as an education, a pastime and a diversion for the lower deck crew. Lectures were infrequent. Hodgson writes with respect to the lecture on July 29th.

> *Lecture-Geology " it was a poor affair and as usual Barne, Shackleton and Bernacchi made their characteristic disturbance.*

Various diversions are mentioned by Duncan (Duncan 1901-1902) on June 9th.

> *I have started a snap album cutting the pictures out of magazines its something to pass the time with I have a half model of the ship in-hand [6] but it is very cold in the workshop…*
>
> *A theatrical party under way Mr Basns is in charge of it & they rehearse in the living house. Its expected to come off in 14 days time, we have had nothing in the way of amusement since 1st. May so things are very slack with our officers. They were to work wonders during the Winter but have not started yet & the Winter is nearly half gone & only 1 concert. We made inquiries about classes being passed but no more was made by the after guards. We don't have any idea of what has been done in the scientific work as they don't give any information. Its rather hard on the Lower Deck hands.*

[6] Half models are timber sculptures of a vessel's hull, normally mounted very attractively on a polished board for display. They were used by ship builders during construction and evolved into an art form.

Bernacchi lectured to the men during the second winter on astronomy and the polar aurorae.

Some of the men worked at handicrafts. Duncan mentions making a sailing ship model (not the half model previously mentioned). Barne converted his short sledge, on which he hauled his sounding (deep sea sampling) equipment to become an ice yacht nicknamed the "Flying Scud". [Appendix IV] This seems to have been a bit of folly with a practical outcome. This is in contrast to Shackleton's rum barrel bogie sled, designed for travel across rough ice and totally impractical for anything. Jacob Cross, Hodgson (1901) reports made:

> *A very fine model of a sledge & ski from the german silver of an old sledge runner.*

Able Seaman Frank Wild, playing under the pseudonym of "John O'Gaunt" was grand champion at one of the other games enjoyed by the lower deck, "Shove-a–penny."

5.7 Physical life

Physical pastimes included walking, skiing (downhill and ski touring), shooting, football (soccer) and hockey. Throughout the winter there seemed to have been ample free time to take long walks, to "Christchurch", around Cape Armitage, uphill to Castle Rock and beyond. Skiing, both downhill and cross-country were popular. Note that at this stage skiing was still undertaken using only one stock. Photos of the Terra Nova expedition show the use of two, more lightweight stocks that must have been a great improvement for ski-hauling sledges.

Regular games of football were held on the ice near the ship. It seems that this commenced as a lower deck activity but quickly became an all-in affair.

There were two significant early sports injuries. Charles Ford (Chief Steward) broke his leg comprehensively in mid February, probably due to inexperience at binding the boots to the skis. This unfortunate mishap was on the far side the Gap and took a couple of hours to get him back to the ship. Duncan reports thus:

> *Some mess mates went out on Skies through the gap. Ford one of the number had the Misfortune to break his leg below the knee…it was a bad break having splintered.*

It is surprising to find the frequency of Duncan's entries describing outdoor recreations during this initial period especially, when the winter quarters were being established, the huts were under construction, and the first sledge journeys were being organised.

The Captain also suffered an injury from a skiing accident. He severely twisted his leg and was unable to take part in the early March sledge trip on recommendation of the doctors. Meanwhile Duncan was becoming a great enthusiast of the sport:

> *We are now going in for skiing its splendid Sport & plenty of falling there is A fine slope near by & we make for that & have some splendid runs about 1 1/2 miles all down hill.*

5.8 Festivities

Markham provided Scott with a diary in which were marked the birthdays of officers and scientists, and days worthy of celebration, like the ship's birthday. This provided an artificial means of marking time, especially through the polar winter. Conviviality in the wardroom was promoted by the availability of cigars, liqueurs, champagne, port and edible delicacies saved for special occasions.

Hodgson describes the wardroom festivities for the April 22nd. sunset:

> *The sun disappears today but as the northern sky was clouded nobody got unduly excited. The event was celebrated with the inevitable champagne + liqueurs, followed by a sing-song. Bernacchi was extensively roasted.*

The first edition of the South Polar Times was issued to coincide with the dipping of the sun.

While on the lower deck Heald (Heald 1901) describes a more muted scene and notes publication of the South Polar Times:

> *Sun left us today spliced the main brace St Georges day. First member of the South Polar Times copied today. Temp -19.5°-36°.*

Midwinter was celebrated on June 23rd. with a variety of revelry and organised events. The Royal Terror Theatre opened its season of "Ticket of Leave" to public acclaim, playing in the living hut. The amateur theatricals are described, and their evolution discussed in Pearson (2004). The second of these was the "Nigger show" cabaret, known as the "Dishcover Minstrel Show" that followed a popular genre of the time with songs, parodies and jokes.

Bernacchi describes the day:

> *At noon a faint twilight flush was visible in the north; but this is the light from a full moon. It was not sufficient to eclipse stars of the 4th magnitude & a small patch of the Milky Way near the constellation of the Southern Cross.*

A sumptuous dinner complete with:

> *Magnums of Möet & Chandon champagne, liqueurs, black coffee, cigars, Egyptian cigarettes etc. Punch as a finale.*

Armitage describes the festivities in Gregory Villa

> *Several of the men sang. Kennar, as usual, was very amusing having not the slightest idea of tune. One of the songsters, on being told by the accompanist (Royds) that he was too high-meaning his voice-promptly stepped down from the platform, causing roars of laughter.*

The Sun's return on August 24th was marked for the crew by distribution of a small bottle of Bass (stout) with dinner.

Skelton had just returned from a sledge journey on October 24th. And wrote:

> *arrived back at the ship from sledging. At dinner we had another excellent meal of seal .& champagne etc., to celebrate the arrival of the midnight sun & our return.*

The King's birthday on November 8th coincided with Bernacchi's own. Skelton describes the scene:

> *…celebrated King's birthday (also Bernacchi's) "We all adjourned to the Ward room, had the table shifted to one end & started a smoking concert, finishing up with His Majesty's health in Whiskey all round….& we also in the Ward room had a very good champagne supper. Nobody got to bed before 1.30 & Bernacchi, Armitage & myself not until 3.0 AM, we having an extremely interesting & ridiculous argument on whether married men should come on polar expedition. Bernacchi's views were the source of amusement.*

A highlight of the King's Birthday festivities was the toboggan race. Armitage reports:

> *After luncheon we commenced the sports with a toboggan race, which was a great success. The favourites were two scotchmen, Duncan and Walker, who certainly owned the fastest toboggan. Duncan was carpenter's mate and had utilized his skill in fashioning wood by making a toboggan on the model of our own sledges.*

In the event the Duncan's Scottish team turned turtle:

> *Me & Walker was on my one straped down & it run away from us & turned several summersaults so we lost the race.*

They lost to (Leading Stoker) Quartley whose toboggan was more elaborate and could be steered. Other competitions for the King's Birthday included sledge pulling, Tug-o-war and slope running on skis. The silk Union Jack was

hoisted for the first time at Hut Point and there was a wardroom concert afterwards. No doubt the absence of the Captain allowed this to be more a relaxed affair. Second Steward, Gilbert Scott, who was working to help promote the polar habit of cross-dressing awarded the prizes for the competition winners.

There was no shortage of diversions, especially during the winter.

5.9 Polar Humour

So-called practical jokes were not uncommon but rarely reported. Dr Keottlitz had "no sense of humour" and was generally the butt of pranks.

Royds describes one event on April 30th.

> *At dinner we had Dr K. on toast by making him bet Bernacchi drinks all round, that he wouldn't "put two chairs back to back, take off his boots and jump over them". Bernacchi of course did it amidst much applause from all of us.*

Bernacchi notes in "Saga"

> *…everyone was eager to peer through his microscope at the wonderful and fearful bacteria he sometimes found, Alas, most of us were so unable to appreciate his enthusiasm that he instituted the "Order of the Ass"- of which I became a member-Fourth Class*

Armitage (1905) writes a similar description:

> *We generally peered through when he had any especially beautiful object on view. Occasionally one or other of us would make some would-be facetious remark. If the culprit was one of the scientific colleagues, Koettlitz would solemnly remark "So-and-so, you surprise me! I should not have expected it of you" If, however, the jester happened to be a nautical man, or Bernacchi, he would be punished by not being allowed to see the next curiosity that emerged from the cabin, and by a stern silence that spoke volumes.*

The ultimate revenge against Keottlitz is a beautifully drawn (obviously by Wilson) Heraldic shield with a full description of each quarter, and the crest "A Cuttlefish Rampant" [Appendix V]

The playbill for the theatrical entertainment "Ticket of Leave" (Bernacchi 1902) came complete with classified advertisements, one of which was in the "Found" column:

> *Found, Three savage white corpuscles. Apply to Bacteriologic -call laboratory.*

Baughman (Baughman 1999) describes another prank:

> *One day during winter, Barne dressed up in wolf skin furs, and Bernacchi played dead in a snowbank near the ship. Koettlitz came upon the scene in the low light of winter, torch in hand, and was startled by the wolf.*

5.10 Harmony or Discord?

Skelton's comments in his diary for September 11th are telling with respect to aspects of preparation for sledging and, more significantly, that there was not always harmony in the wardroom:

First he notes the departure of Armitage's sledge party:

> *…They started off on ski, at which I was rather surprised for two reasons; firstly, Armitage has always been rather a detractor of ski for sledge pulling, in fact I believe he even advised the Skipper at the beginning of the expedition that they were no good for it; secondly , the condition of the surface was such that no advantage was gained from ski, rather if anything a loss in speed....Armitage is a peculiar chap, especially with regard to his arguments, & he might have started on ski simply for the sake of saying that he had proved they were not so good as ordinary walking. His methods are not always genuine.*

Skelton then goes on to make comment about Shackleton thus:

> *... I understand the Captain's party are going on Saturday to the Bluff. Shall be jolly glad to get rid of them. While they are preparing, the Ward Room becomes a simple nursery, Shackleton 'gassing' & 'eye serving' the whole time, ponderous jokes flying through the air, articles being weighed to the hundredth of a pound, instructions being given not to beeswax the thread or to go easy with brass eyelets on account of the extra weight.....why he (Scott) listens to Shackleton so much beats me. The man is just an ordinary 'gas-bag'.*

There are however, in spite of the diversions and recreations, a few examples of discord that are not reported in the mainstream literature related to the *Discovery*.

Baughman (1999) comments that:

> *For the most part, the Discovery was a 'happy ship" (Scott's published phrase), and no discredit is cast upon the members of the expedition when a closer look at the sources reveals the occasional spat. Given the close quarters for such a long period of time, the Discovery was fortunate in the good relations among the men and officers.*

It has come to light recently that there was more than a normal amount of acrimony between Scott and Armitage. The private original journals of Armitage came to auction and the catalogue related some of the content in relation to this matter. The following is an extract form a 2004 catalogue of items for auction at Bloomsburies (Armitage 1901) and describes the original hand written journals of the Pilot (Armitage) for the dates mentioned. This indicates that there was considerable tension between Scott and his second in Command. Armitage was of course Naval reserve and had previous polar experience. Apparently Scott had applied pressure to try to repatriate Armitage (with other naval reservists) after the first year. Armitage successfully resisted. I surmise that he found it difficult to work with Scott whom he would have found lacking in some areas of leadership.

> *On 8 October 1903 after a squabble between the two men about the accuracy of the chronometer readings Armitage is driven to make this observation on Scott: "The Captain… is that kind of man who always wants 'just a little more', although all his own ducks are (by his own account) swans. A curious fellow."*
>
> *Again on 21 October 1903 he records: "When the captain went to turn in I went to his cabin to ask the reason of his unfriendly manner towards me, for since his return he has hardly spoken a word to me, & ignored me when I have spoken to him, or answered very briefly. After hesitating for a little, he replied…" and again tantalisingly more leaves are excised.*
>
> *Royds was to comment later that Scott and Armitage fell out over Armitage's plan for another expedition to go furthest south and after that Scott barred him from the sledging list for 1903.*

Armitage must have been galled when he read Scott's official account of the expedition (Scott 1905) that hardly mentions the names of expedition members, or their achievements. Reading the narrative it would be easy to infer that Scott discovered the Polar Plateau, when in fact it was the achievement of Armitage.

There were some physical fights also but on the lower deck. These seem minor and are not mentioned in the official narrative. On October 14th there was:

> *a Knock out on the mess deck this morning. The Doctor had to stich up the wound.*

Too Much Recreation?

I agree with Baughman's (1999) assessment about the level of harmony in the wardroom. I believe it was due to a combination of planning with respect to structured activities as well as the fact that the wardroom was populated by active intellects that had enough maturity to see them through.

> *The men of the Discovery had survived the winter without the depression that had been such a sad feature of other polar expeditions. Moreover, the crew of the Discovery distinguished themselves for their good cheer and determination to keep to the work at hand. Neither mess deck nor wardroom was populated with saints, but their ability to cooperate with one another for the benefit of science and for the honor of their flag casts great credit on the whole company.*

It is a complete mystery to me that Scott changed the bluejackets routine to allow idle afternoons in winter, when there was clearly a huge amount of preparation to be done? This decision seems inexplicable and resulted in discontent by crew at long hours making sleeping bags and sledging gear as Spring approached? This of course was complicated by the need to keep working on extracting the ship's boats from their icy grave as every blizzard re-buried them.

The atmosphere in the wardroom was like a cosy gentleman's club much of the time and must have appealed greatly to many of the officers and scientific staff. It's no surprise that preparatory work was still feverishly being carried out right up to the departure of the main spring sledging enterprises. There was a gulf between the wardroom and the lower deck, and it may be that Scott just didn't appreciate the amount of time required for the crew to complete the preparations for spring.

Huntford (Huntford 1979) sums up his support for the proposal that opportunities were squandered thus:

> *Most of the winter had been wasted in irrelevant diversions, there was now a rush to be ready in time.*

6 : Concluding Remarks.

6.1 Conclusions and Afterthoughts

Conclusions

Conclusions of this study, based mostly on selected primary sources and supported by central secondary sources are that:

The aftermath of the expedition shows the Agenda of Sir Clements Markham to provide a training ground for young ambitious British gents was not realised. Geographic exploits were successfully undertaken, but may have been more productive if lessons on the technology and techniques of sledge travel and polar survival had been better learned. It was only after Scott's party had perished in 1912 that Franklin was replaced as the popular British hero.

Learning in these matters did take place during the expedition, but it was not systematic, and did not evolve sufficiently for effective application during this enterprise. It ultimately underpinned later expeditions' work, especially Scott's return on the *Terra Nova*. There is a great deal of evidence to suggest that opportunities to learn before and during the expedition were squandered.

Scott's *Discovery* expedition was ill prepared in terms of leadership as the tasks at hand were significantly more complex than the leader had been trained, or had experience to manage.

Scientists are as worthy of recognition for "Heroic Deeds", as explorers. Good science was carried out but the results were handled poorly, and the scientists themselves treated in a shabby manner upon their return to England.

There was more than adequate opportunity for recreation on board, especially during winter. Work routines were implemented that shortened working hours resulting in the need for great urgency in preparation as the spring 1902 sledging season approached.

The wardroom of the *Discovery* doubled as an elite gentleman's club reinforcing entrenched attitudes of class, white superiority and the importance of the British Empire.

Afterthoughts

On his 54th birthday (8th November) in 1930 Louis write to his brother Roderick (Dick) commencing with the proverb " The better the day the better the deed."

He laments the passing of "my old friend Colbeck". Colbeck had been Captain of the relief ship *Morning* and Bernacchi had taken advantage of the long stay of the ship against the ice in both early 1903 and 1904 to rekindle his friendship with Colbeck, who had also been on the *Southern Cross* expedition. Bernacchi had kept in contact with his old messmates and had an

enduring involvement in polar matters. I believe it is fortunate that he was energetic and had a level of confidence that allowed him to move ahead after the return of *Discovery*, and not to dwell too much on disappointment that he only achieved modest notoriety and little further scientific work after 1905.

Further scholarship that may be undertaken based on the materials consulted during this project that would bring valuable new theses and information to the body of polar historic literature are as follows:

- Publication of Bernacchi's *Southern Cross* and *Discovery* diaries in full.
- A complete biography of Bernacchi.
- Publication of correspondence and writings of Bernacchi
- An improved history of geomagnetic science in high latitudes with special reference to the Antarctic expeditions of the heroic era.

6.2 Acknowledgements

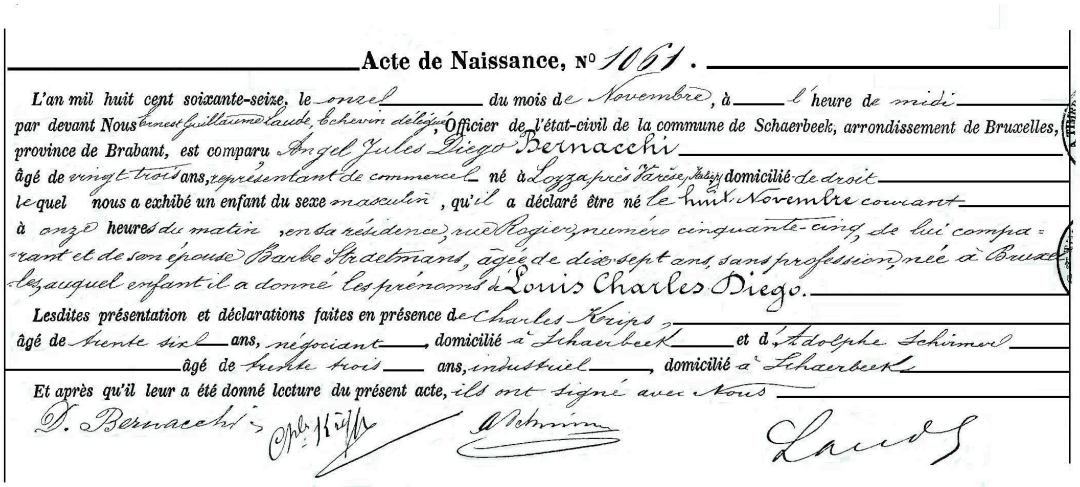
I would like to thanks the descendants of Louis Bernacchi living in the Canterbury District of New Zealand who have allowed me free access to the valuable legacy of Bernacchi in the form of letters, photographs and ephemera that has not been the subject of any scholarly studies before this. Also, thanks to the staff of the Manuscripts room of the Museum of Canterbury for their patience and assistance.

I would also like to thank my primary supervisor, Katie Pickles for guidance and constructive criticism.

I am greatly indebted to my Messmates from GCAS who have provided encouragement, and who have fed my obsession by listening to me drone on about obscure topics. They know who they are.

6.3 Appendices

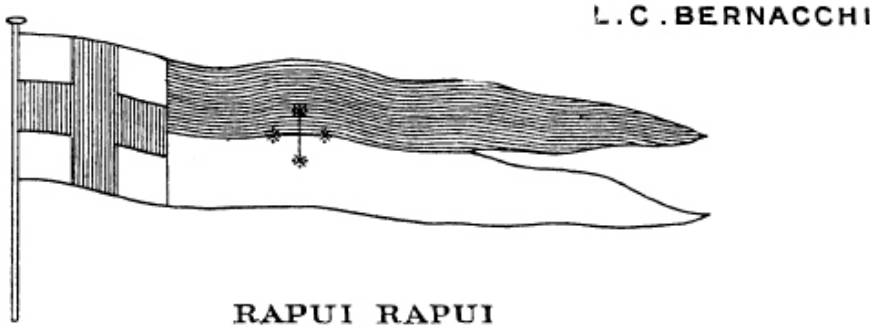
I: Louis Bernacchi Birth Certificate



Acte de Naissance, N° 1061.

L'an mil huit cent soixante-seize, le onze du mois de Novembre, à 1 heure de midi
par devant Nous Ernest Guillaume Claude Lecheveau délégué Officier de l'état-civil de la commune de Schaerbeek, arrondissement de Bruxelles,
province de Brabant, est comparu Angel Jules Diego Bernacchi
âgé de vingt-trois ans, représentant de commerce né à Lozzapiès Parme, Italie domicilié de droit
lequel nous a exhibé un enfant du sexe masculin, qu'il a déclaré être né le huit Novembre courant
à onze heures du matin, en sa résidence, rue Rogier, numéro cinquante-cinq, de lui compa-
rant et de son épouse Barbe Stradetmans, âgée de dix-sept ans, sans profession, née à Bruxel-
les, auquel enfant il a donné les prénoms de Louis Charles Diego.
Lesdites présentation et déclarations faites en présence de Charles Krups
âgé de trente six ans, négociant, domicilié à Schaerbeek et de Adolphe Schimmel
âgé de trente trois ans, industriel, domicilié à Schaerbeek
Et après qu'il leur a été donné lecture du présent acte, ils ont signé avec Nous
D. Bernacchi

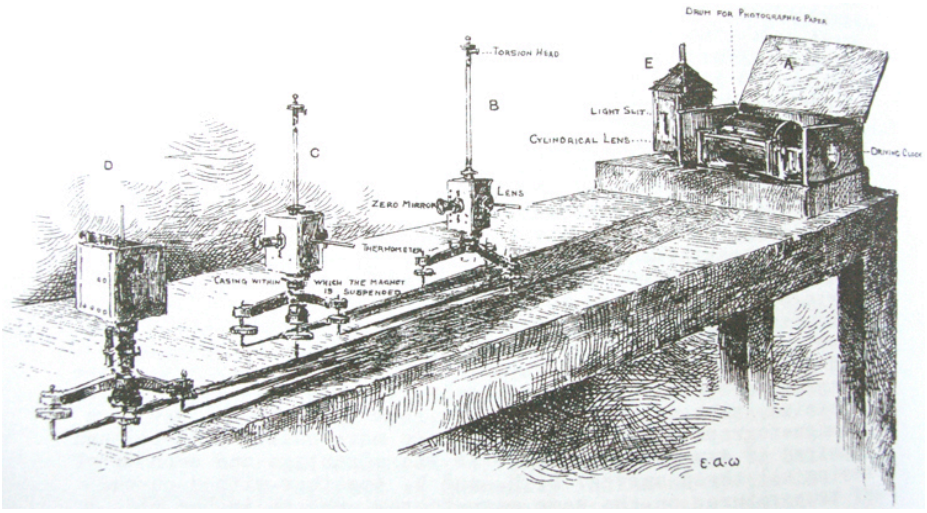
II: Sledging Pennants.



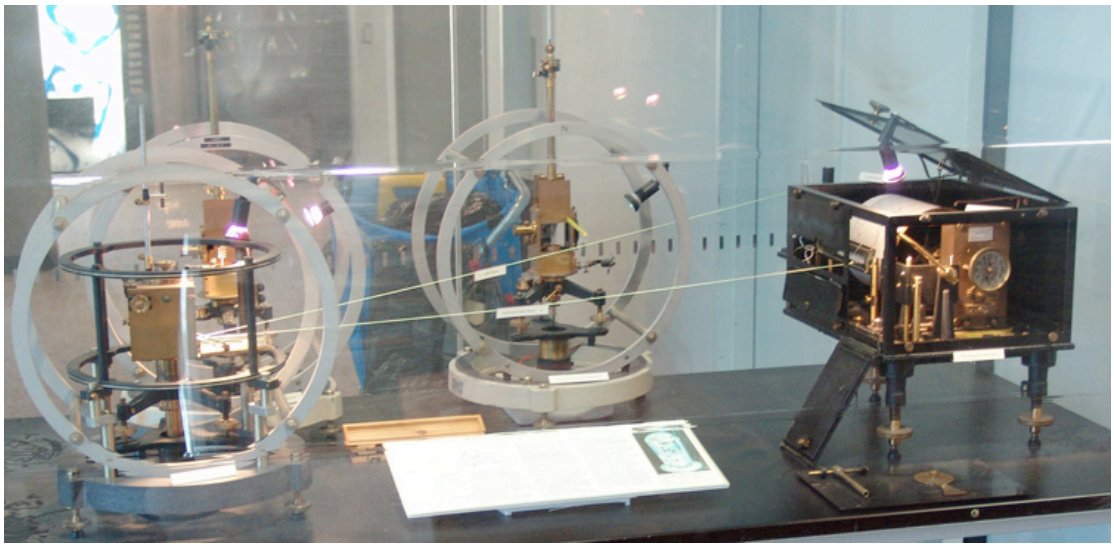
Bernacchi (1902) describes the design of his sledging pennant thus;

> The base of the flag is the red St George's Cross on a white ground & the body of the flag a deep blue in the centre of which are the white stars forming the constellation of the "Southern Cross" (Crux) beneath which is a Maori motto Rapua, Rapua, kakitea

III:The Eschenhagen Magnetometer



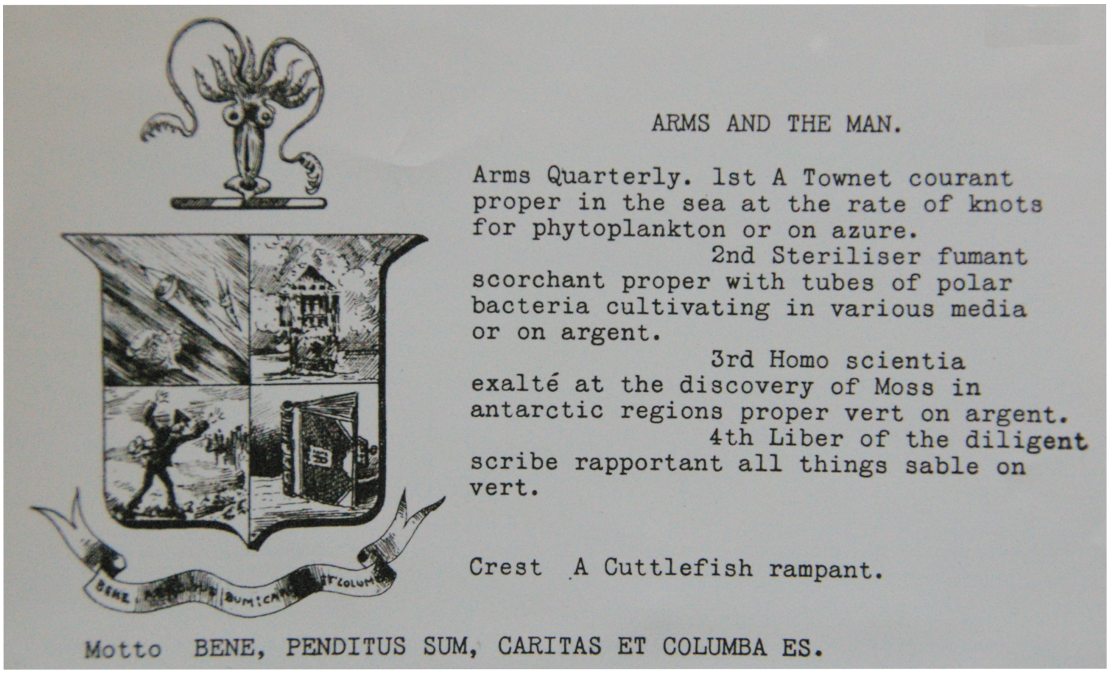
Wilson's line drawing of the Discovery's magnetometer on the oak bench



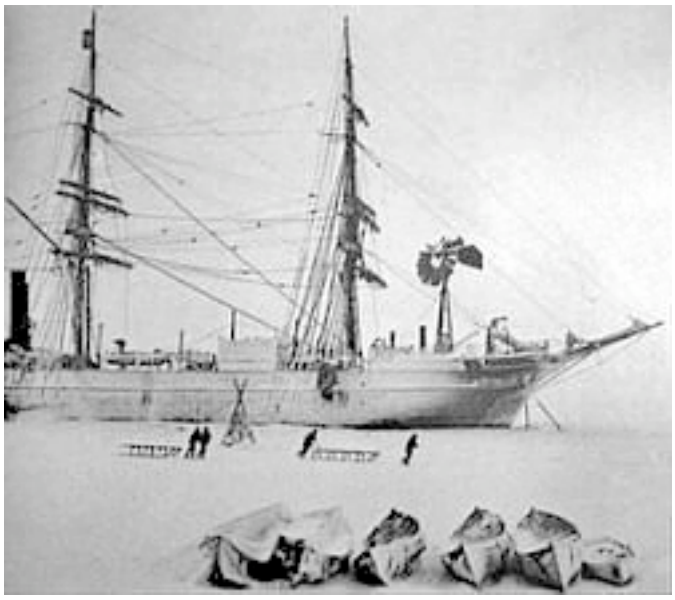
Recent photograph of an Eshenhagen Magnetometer on Display at Geoscience Australia in Canberra.

IV: Barne's "Flying Scud"

V: A Cuttlefish Rampant



VI. One photograph, two Disasters



The windmill after the first blizzard damage, and the boats on the ice on the foreground.

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